COTTON

Volume 84
Number Seven
$1.00 a Year.

MAY, 1920

Published monthly by
W. R. C. Smith Publishing Co.,
Dalton, and Atlanta, Ga.

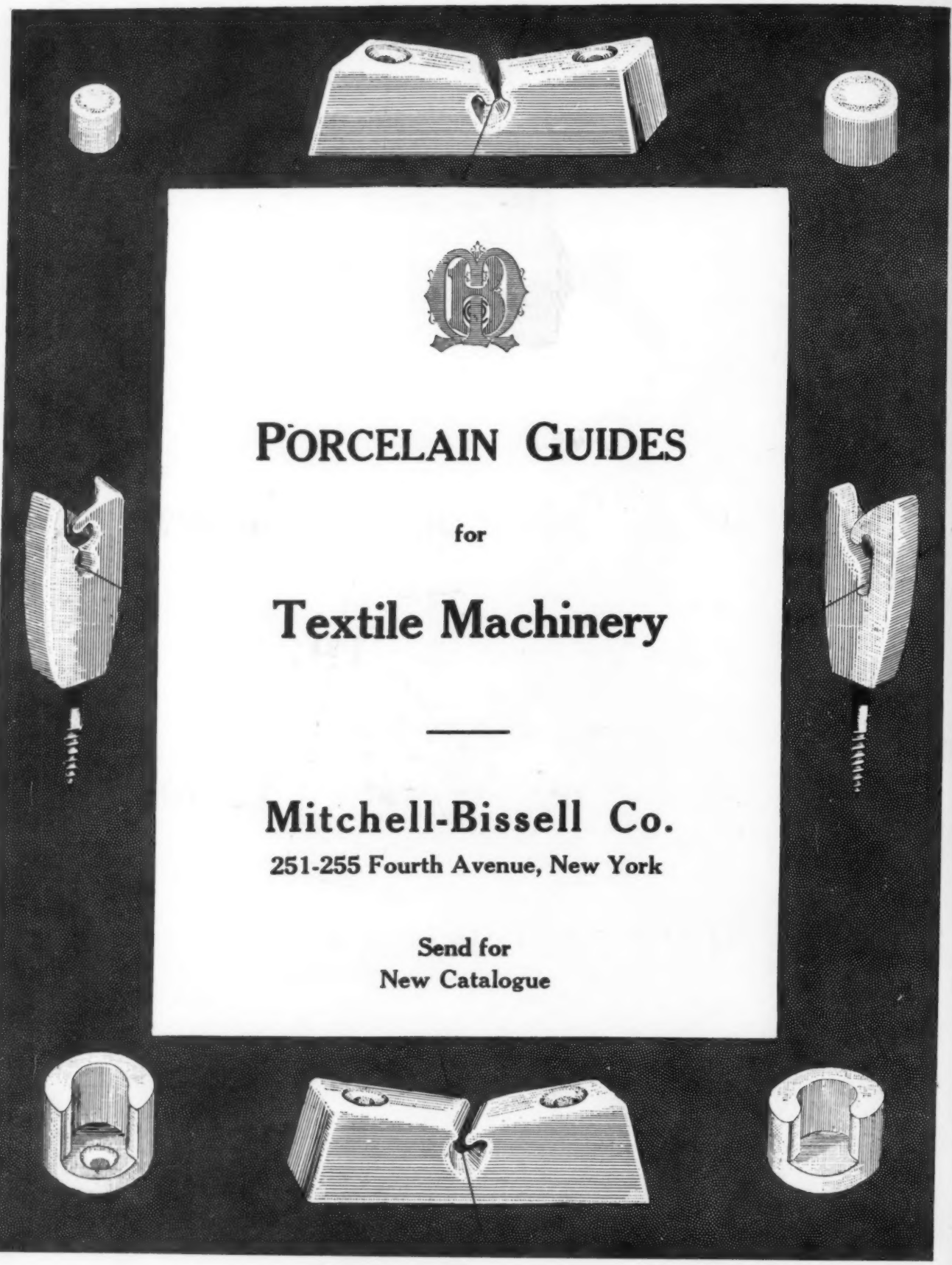
Entered as second-class matter at the postoffice, Dalton, Ga., under Act of March 3, 1879.

CURVED BASE—SPLIT WIND
CLEAN KNIT CONE

Parts to make this cone fit any No. 50 "UNIVERSAL" coner.
Pronounced by Leading Knitters the best Supply yet produced.

UNIVERSAL WINDING COMPANY
BOSTON

MAY 20 1920



PORCELAIN GUIDES

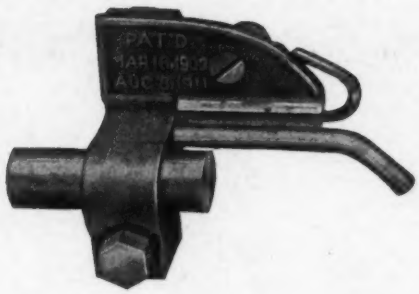
for

Textile Machinery

Mitchell-Bissell Co.

251-255 Fourth Avenue, New York

Send for
New Catalogue



Over 212000

MacColl Patent Spooler Guides

in use up to

January 1 1920

Adapted to both

Cotton and Worsted Yarns

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

Southern Office
188 South Forsyth Street Atlanta Georgia

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MAKING LOOMS MORE PRODUCTIVE

Hyatt Roller Bearings have been used on looms with perfect satisfaction for the past four years. Besides increasing production approximately 26% they—

1. Save power and permit the looms to be easily turned by hand.
2. Insure perfect lubrication and save oil, because they need oiling but once every three or four months.
3. Eliminate dripping of oil, thus keeping the floors, yarns or fabrics clean.
4. Protect the shaft and other parts from wearing by absorbing shocks and vibrations.
5. Are fool-proof, requiring no adjustments.
6. Represent an investment from which you will realize handsome returns.

Send for our engineering data at once.

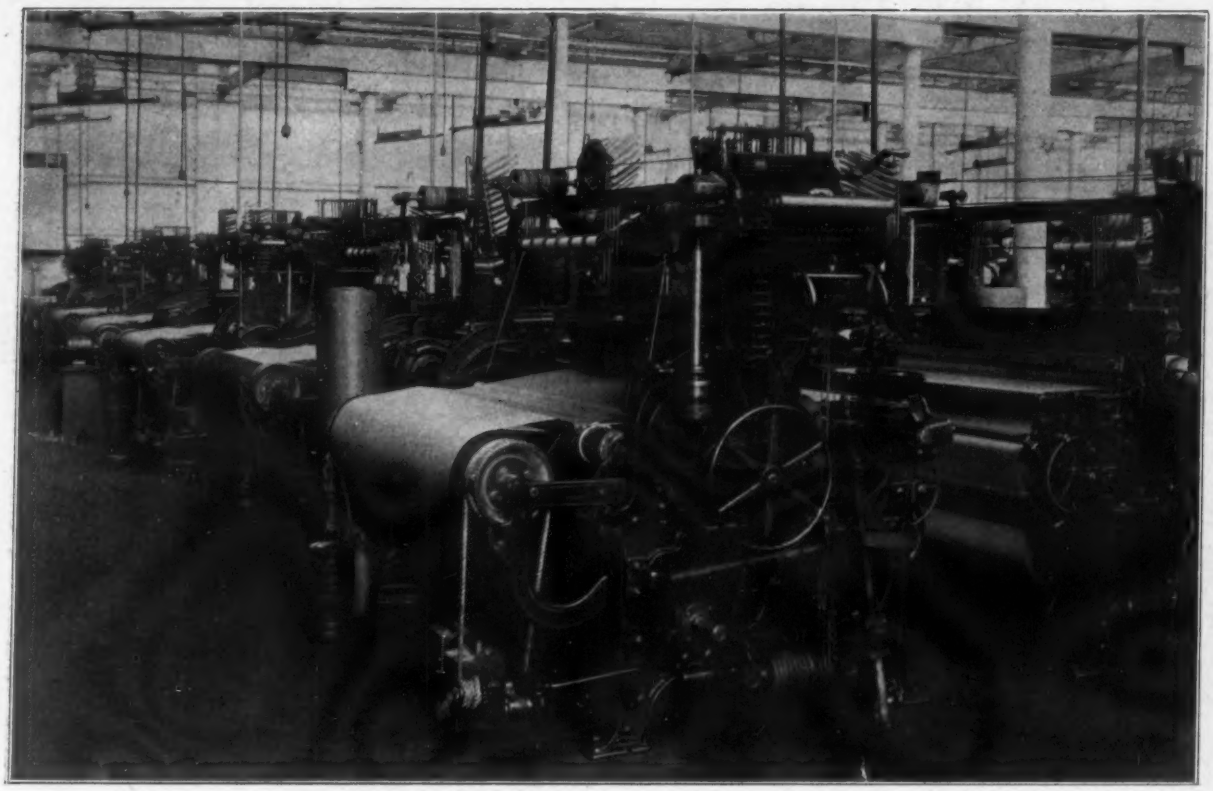
HYATT ROLLER BEARING COMPANY

Motor Bearings Division
Detroit, Mich.

INDUSTRIAL BEARINGS DIVISION
NEW YORK, N. Y.

Tractor Bearings Division
Chicago, Ill.

Hyatt Bearings For



Hyatt equipped looms in the mill of the Stewart Silk Company, Easton, Pa., which increased production approximately 26%.

Recently a test run on Hyatt equipped looms in the mills of the Stewart Silk Company, Easton, Pa., showed an approximate increase in production of 26 per cent. If you want to increase your production specify Hyatt Roller Bearings on your next order for looms. Write for our engineering data at once.

1954

Motor Bearings Division
Detroit, Mich

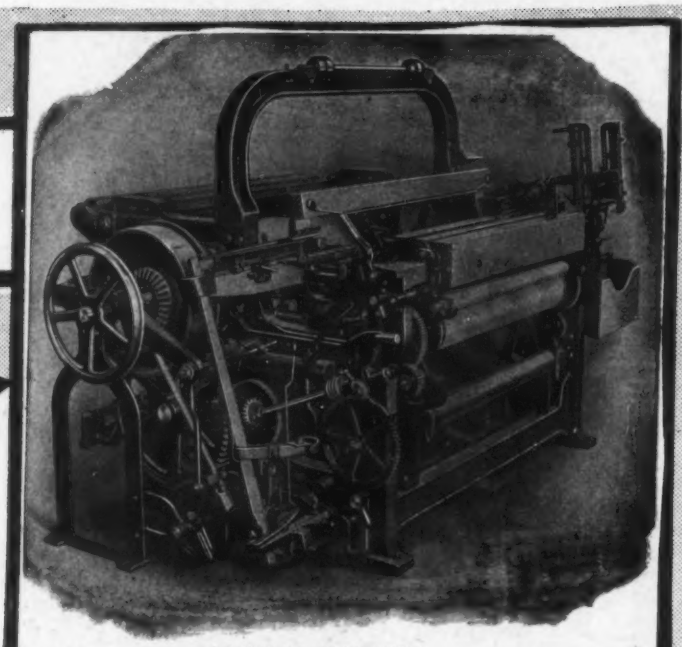
Hyatt Roller Bearing Company
INDUSTRIAL BEARINGS DIVISION
NEW YORK CITY.

Tractor Bearings Division
Chicago, Ill.

Manufacturers of Bearings for Mine Cars, Ore Cars, Steel Mill Cars, Roller Tables, Trolleys, Cranes, Hoists, Machine Tools, Line Shafts, Countershafts, Concrete Machinery, Textile Machinery, Conveyors, Lift Trucks, Industrial Trucks, Railway Service Cars, Storage Battery Locomotives, etc.

Textile Machinery

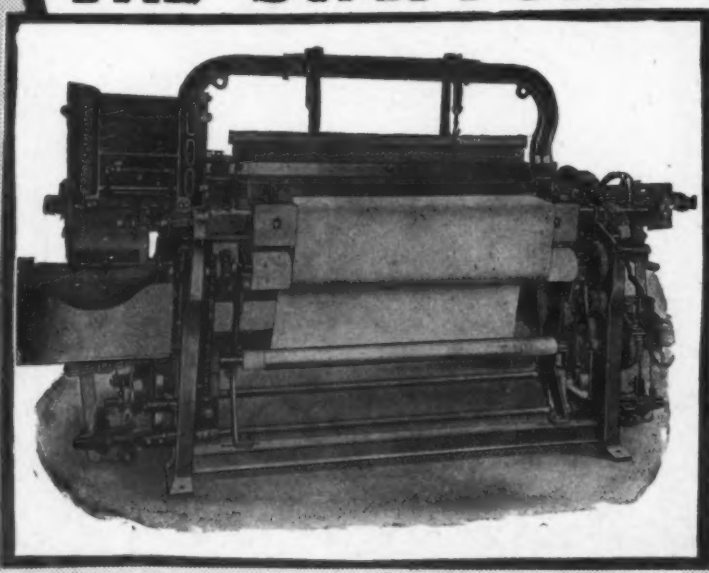
Dependable Looms



STAFFORD DUCK LOOM

The Stafford Company for a great many years has concentrated on the production of a strictly practical loom. Convincing proof of the soundness of this idea is found in the large list of repeat orders for Stafford looms from a steadily growing list of progressive mills both in this country and Canada.

THE STAFFORD COMPANY



Readville
Mass.

Southern Agent
J. H. MAYES
Charlotte
N.C.

Proven Excellence

RIGHTLY, you exercise caution in the selection of Cotton Softeners. Relative to other items in your processes, the amount of Softener used and its cost are of minor importance. Yet the effects of the quality and suitability of a softener are far reaching. If you know when you are "well off" in this respect, you will hesitate to change softeners unless conditions arise which make it necessary. If you are using a good softener that is always of uniformly good quality and exactly suited to your work, you don't need our advice to "stick with it." But—

There are constantly coming to us inquiries from concerns who have a "Softener problem," arising from one cause or another. That's how we get most of our new accounts. Where others have failed, our Softeners succeed through sheer superiority. This isn't a recent thing, it has been happening year after year, year in and year out. We sometimes fail—but not until we have gone to the bottom of the thing and found conditions which could not be remedied. Our products are not panaceas. This Company is essentially an oil company and we take this means of putting out oils in forms most efficient and convenient for our trade.

Excelsior Cotton Softener

is an emulsion of the fat, soap and adhesive type. Long ago the ingredients were selected because the best practice in textile work had made use of them almost from the beginning of the industry. The kind of fat, the type of soap and the nature of the adhesive used in Excelsior Cotton Softener and their relative proportions have been standardized to the most exact limits, as indicated by results of a long experience and careful, scientific investigation.

Don't confuse our Softeners with "Sizing Compounds" or weighting materials. This is exactly what they are **not.** None of our products contain starch, clay, talc, glue, gums, etc. They are emulsions of prime fats and oils, containing only what other substances are necessary to make smooth, stable emulsions, which can be used with the maximum of efficiency, uniformity and economy.

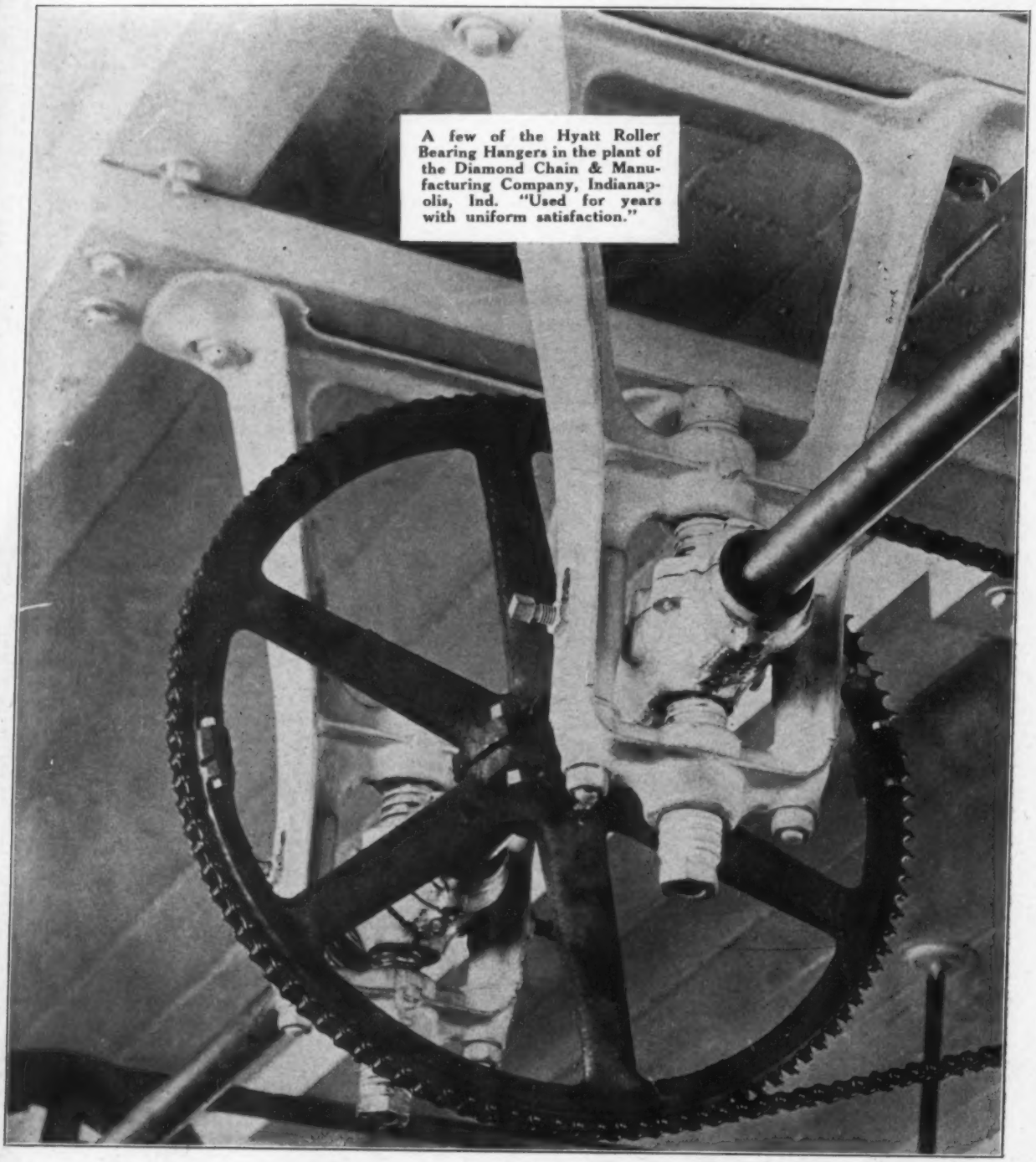
The excellence of our Softeners is a proven reality.

Write

TEXTILE OIL DEPARTMENT

The Moore Oil Refining Co. Cincinnati, O.

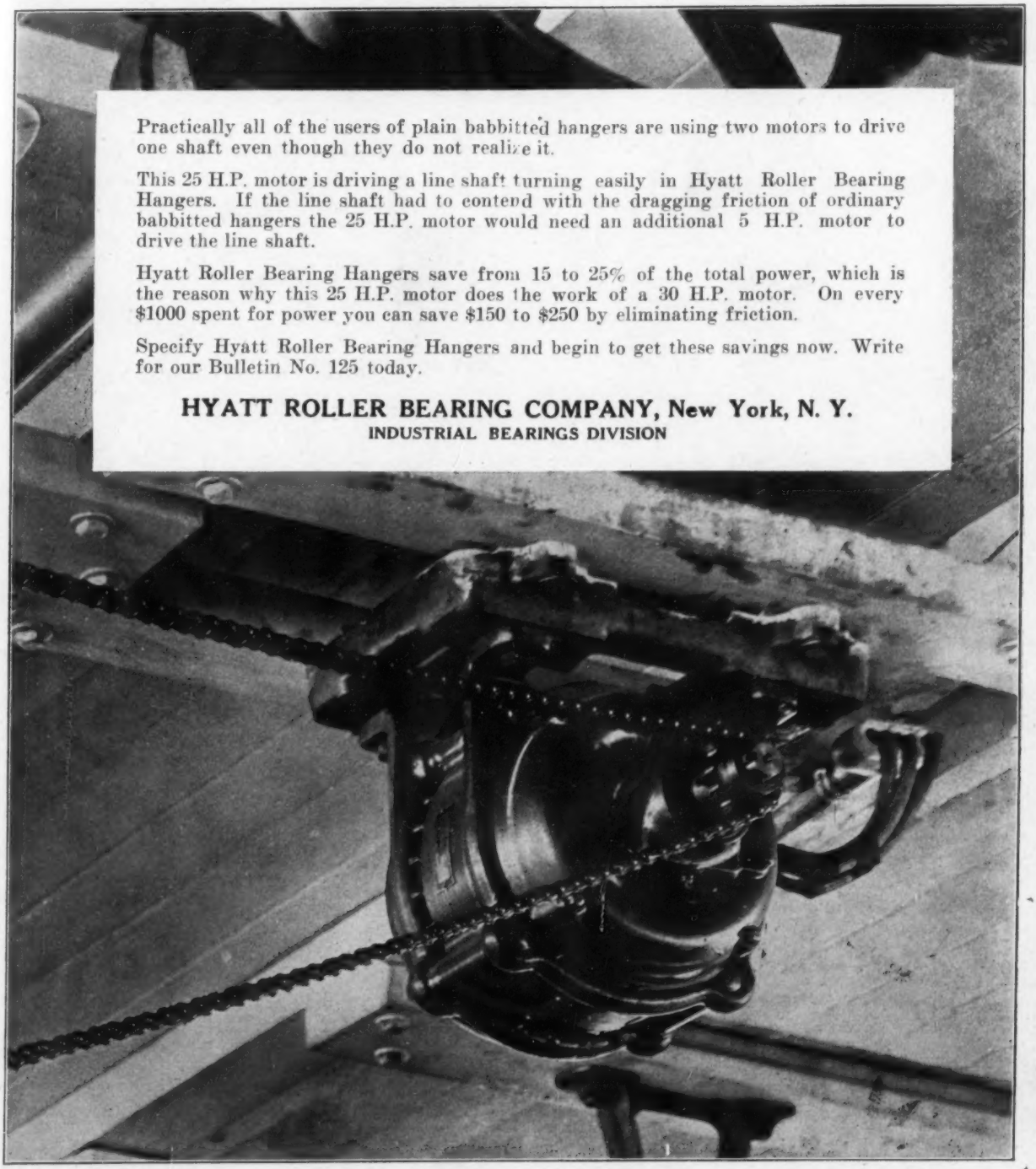
DO YOU USE TWO MOTORS



A few of the Hyatt Roller Bearing Hangers in the plant of the Diamond Chain & Manufacturing Company, Indianapolis, Ind. "Used for years with uniform satisfaction."

HYATT BEARINGS

TO DRIVE ONE LINE SHAFT?



Practically all of the users of plain babbitted hangers are using two motors to drive one shaft even though they do not realize it.

This 25 H.P. motor is driving a line shaft turning easily in Hyatt Roller Bearing Hangers. If the line shaft had to contend with the dragging friction of ordinary babbitted hangers the 25 H.P. motor would need an additional 5 H.P. motor to drive the line shaft.

Hyatt Roller Bearing Hangers save from 15 to 25% of the total power, which is the reason why this 25 H.P. motor does the work of a 30 H.P. motor. On every $1000 spent for power you can save $150 to $250 by eliminating friction.

Specify Hyatt Roller Bearing Hangers and begin to get these savings now. Write for our Bulletin No. 125 today.

HYATT ROLLER BEARING COMPANY, New York, N. Y.
INDUSTRIAL BEARINGS DIVISION

FOR LINE SHAFTS

Westinghouse

Mechanical-Drive Turbines 15 to 500 hp.

For Driving Pumps, Fans, Blowers, Etc.

Most Convenient to Inspect

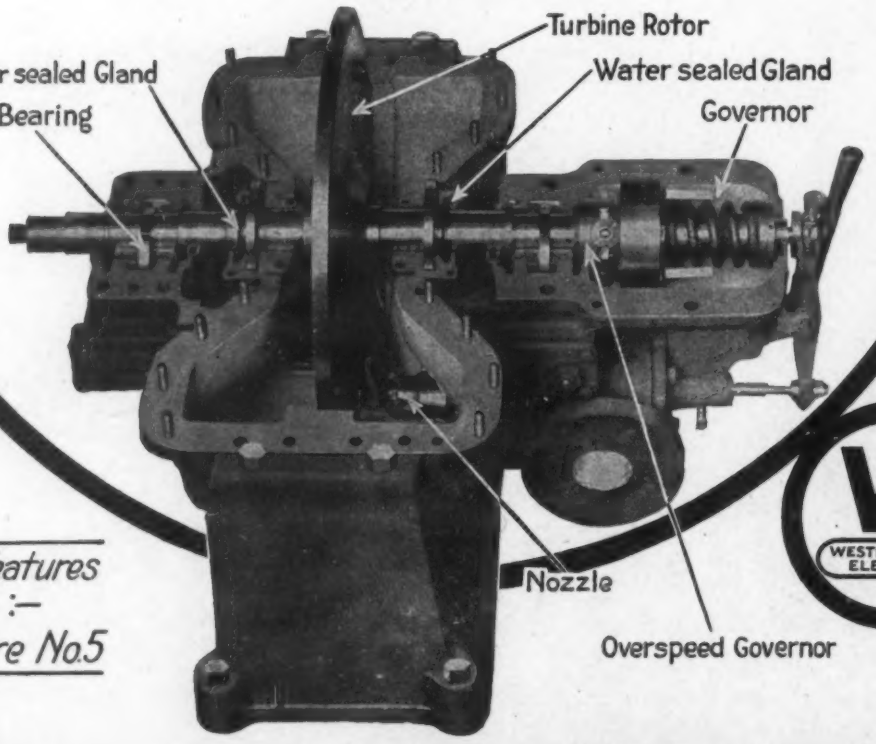
It is not necessary to break either the live steam or the exhaust connections to inspect this turbine.

The simple removal of the cover brings all interior parts to view, thus greatly reducing the time necessary for inspection or replacement.

This is another of the several advantageous features of the new Westinghouse Mechanical-Drive Turbine tending toward better power house practice and shorter plant outages.

Ask for Descriptive Circular No. 3907-A.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Penna.



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WESTINGHOUSE ELECTRIC

New Features Series :— Feature No.5

Rosemary Manufacturing Co.

ROANOKE RAPIDS, N. C.

Using a Large Number of Individually Driven Looms

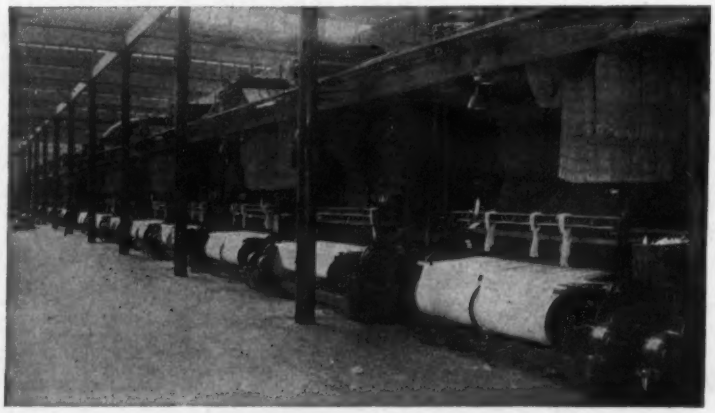
Like the many others who have installed Westinghouse Individual Loom Motor Drive, the Rosemary Manufacturing Co. has achieved these results:

(1) A product of better quality.
(2) A reduction in power expense.
(3) Increased output.

The satisfaction experienced with Westinghouse Individual Loom Drive is clearly indicated by the frequent repeat orders that have come from this customer.

The broad experience of Westinghouse Textile Power Experts is always available in the solution of your power problems.

Westinghouse Electric & Manufacturing Co.
East Pittsburgh, Pa.
908

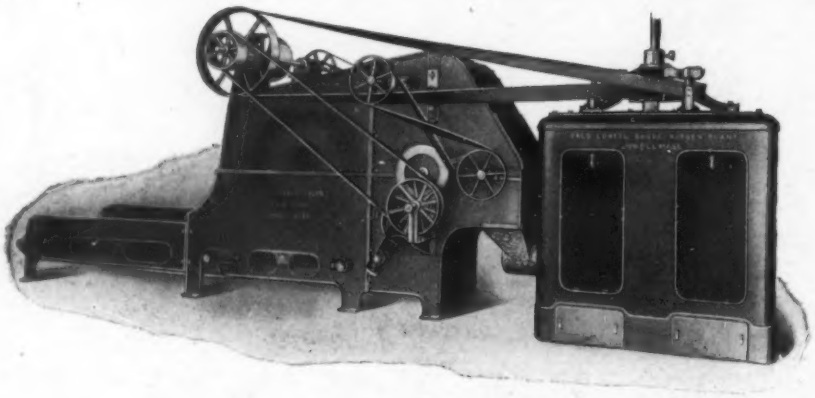


Westinghouse

SACO-LOWELL SHOPS
Cotton Machinery

INCLUDING

OPENING, CONVEYING AND DISTRIBUTING EQUIPMENT



VERTICAL OPENER COMBINATION

PICKING ROVING WARPING
CARDING SPINNING SLASHING
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Waste Reclaiming Machinery

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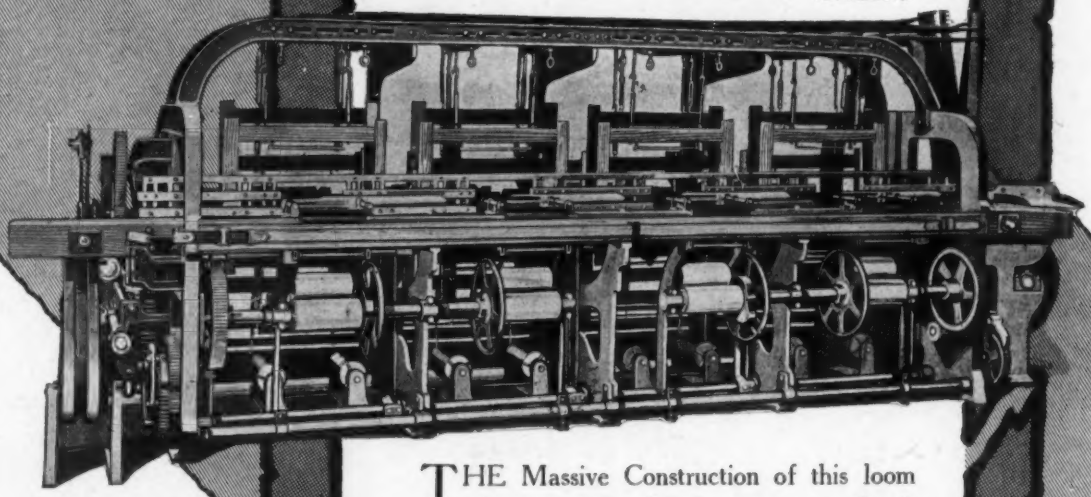
FLETCHER WORKS

Formerly

Schaum & Uhlinger



COTTON BELTING LOOM

THE Massive Construction of this loom gives assurance that in every operation it possesses the ruggedness necessary to weave belting and heavy webbing in 2, 3 and 4 ply weaves.

Arranged for either belt or motor drive.

This loom will make:

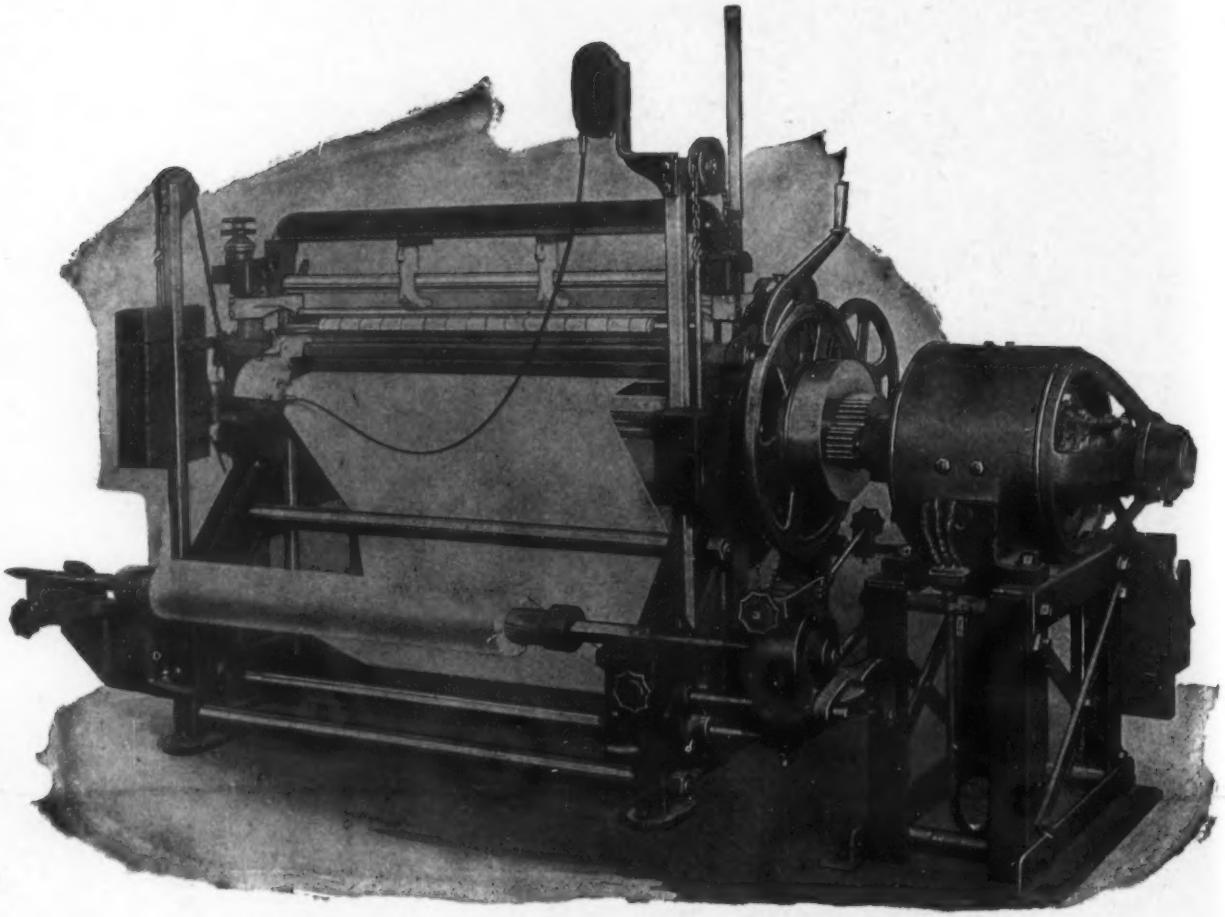
4	pieces of	8	in. web.
6	pieces of	4¾	in. web.
8	pieces of	3	in. web.
10	pieces of	2¼	in. web.
12	pieces of	1½	in. web.

If you will send samples of belt you desire to make our engineering department will be pleased to advise you about the right loom to use.

Write for catalog or other information about Fletcher Works looms.

FLETCHER WORKS

Glenwood Ave. & 2nd Street
Philadelphia, U. S. A.



CAMERON

SLITTING AND REWINDING MACHINE

for converting wide webs into firm rolls of strip

The enormous demand for material in the form of strip in rolls or coils has made the Cameron Principal Slitting and Rewinding Machine an important part of the textile manufacturer's equipment. If one considers only briefly, the many uses for strip or tape cut from broad webs of various materials, the list would be a very long one indeed. Manufacturers of flags, automobile tires, typewriter ribbons, canvas belting, carriage and auto tops, upholstery, surgeons' bandages, manufacturer of electrical insulation, tape, corset manufacturers and the immense requirements of the manufacturers of clothing, shoes, underwear, bindings and trimmings make the Cameron Machine a profitable investment for the up-to-date textile mill man. The market for goods furnished in this form seems to be unlimited.

The Cameron Machine can be hooked up to your present machine and is capable of converting over ten thousand yards of wide fabric into strips, per day.

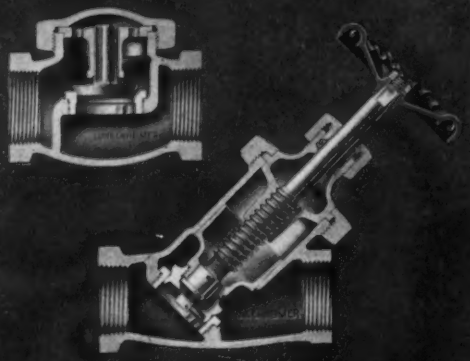
Let us send you interesting particulars, catalog and other literature.

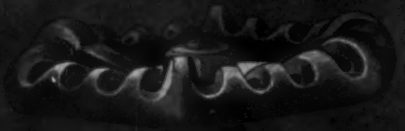
Cameron Machine Company

57-61 Poplar Street, Brooklyn, N. Y.

—made to last a long time

LUNKENHEIMER "RENEWO" VALVES





Have achieved an enviable record for economy in steam service. They represent the highest development in valve construction, incorporating all the good features discovered and developed in over half a century of valve manufacture.

Their installation means permanence in the line, because they are as near wear proof as can be attained, and to further enhance their durability all the parts are interchangeable and can be replaced should necessity require.

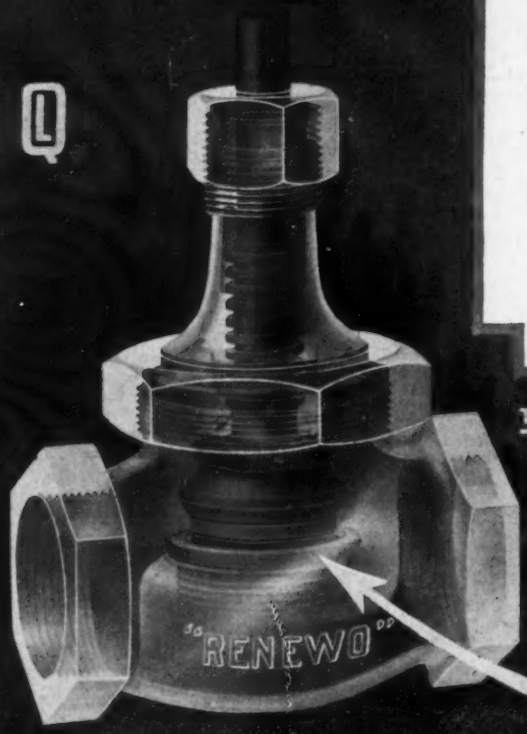
"Renewo" Valve parts are made of materials best suited to the duty the part performs.

The ***Renewable Seat*** and ***Disc*** are made of Lunkenheimer "Valve-nickel," a material having exceptional wear-resisting qualities; the Disc is provided with the celebrated Lunkenheimer "Seat-guard" which aids in preserving the seating faces and keeping them clean, and the seating surfaces are regrindable. The stem is made of a special bronze; the thread is extra long and has full contact when valve is opened or closed.

The union bonnet connection with outside protected threads; deep stuffing box with gland follower, and the self-cooling malleable iron handwheel are other points of merit.

Globe, Angle, Cross, Straightway or Y and Horizontal and Angle Check Patterns for 200 and 300 pounds working steam pressures. Specify LUNKENHEIMER "RENEWO" and insist on having the genuine.

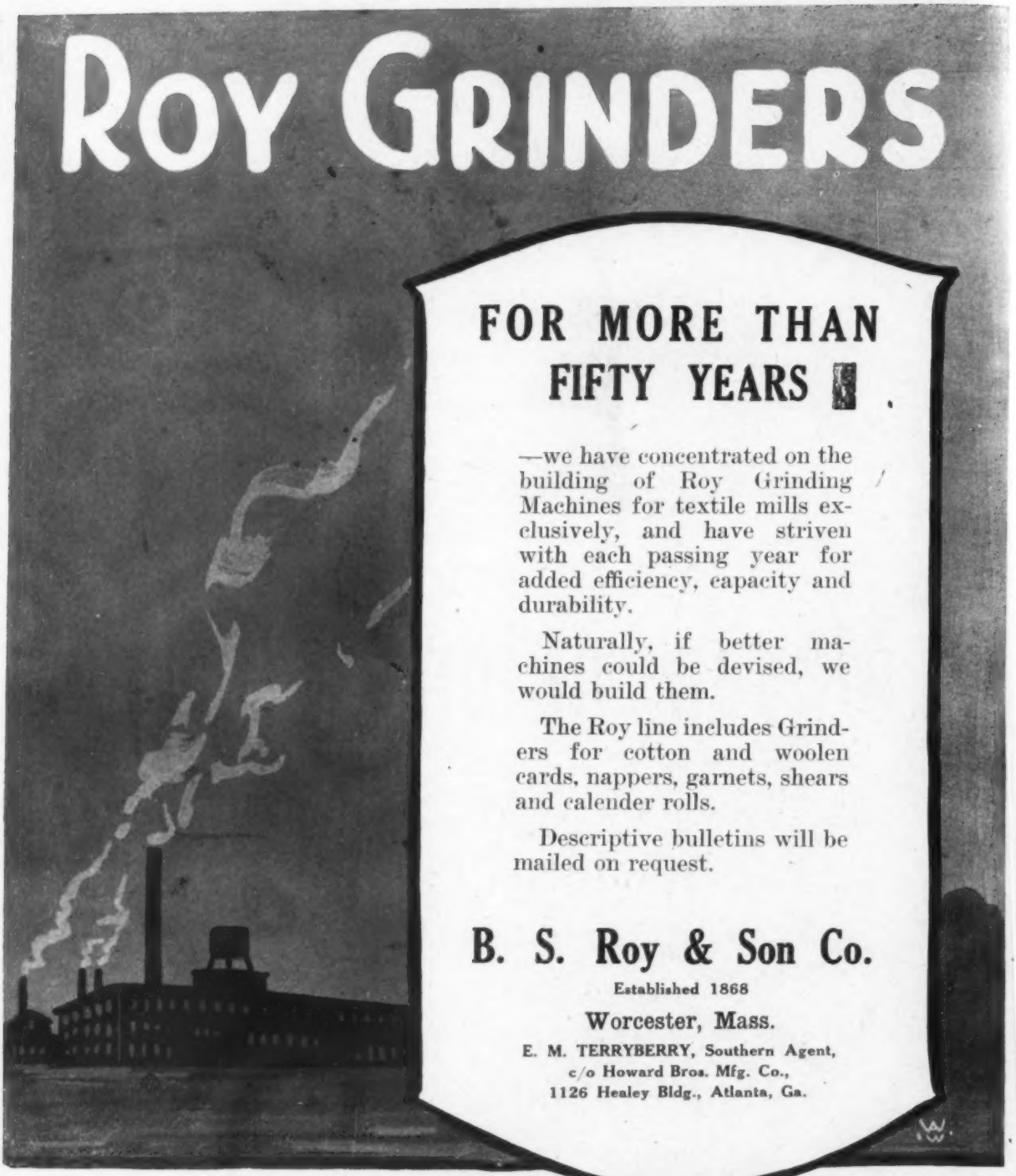
Write for descriptive booklet F 535-AK



THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERING SPECIALTIES IN THE WORLD
CINCINNATI
NEW YORK
CHICAGO
BOSTON
LONDON

AMERICA'S BEST
LUNKENHEIMER
"QUALITY"
SINCE 1862

ROY GRINDERS



FOR MORE THAN FIFTY YEARS

—we have concentrated on the building of Roy Grinding Machines for textile mills exclusively, and have striven with each passing year for added efficiency, capacity and durability.

Naturally, if better machines could be devised, we would build them.

The Roy line includes Grinders for cotton and woolen cards, nappers, garnets, shears and calender rolls.

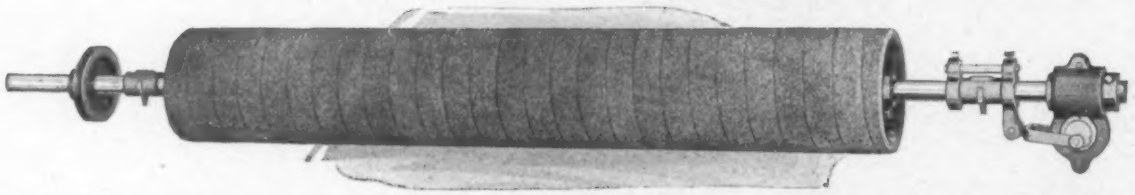
Descriptive bulletins will be mailed on request.

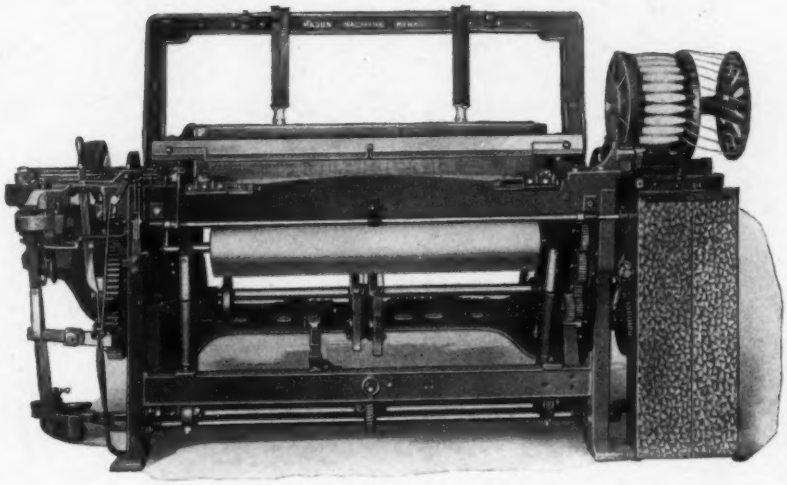
B. S. Roy & Son Co.

Established 1868

Worcester, Mass.

E. M. TERRYBERRY, Southern Agent,
c/o Howard Bros. Mfg. Co.,
1126 Healey Bldg., Atlanta, Ga.





Mason Automatic Loom

With Battery, Warp Stop Motion, Feeler and Shuttle Lock. Randolph Crompton's patents. Fewer parts. Standard Construction. Rebounding Shuttles Overcome. Damage to Shuttles and Bobbins Reduced.

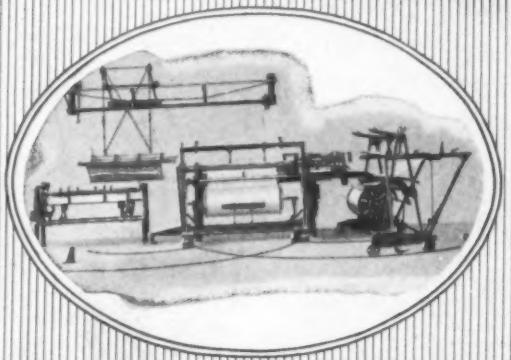
Mason Machine Works

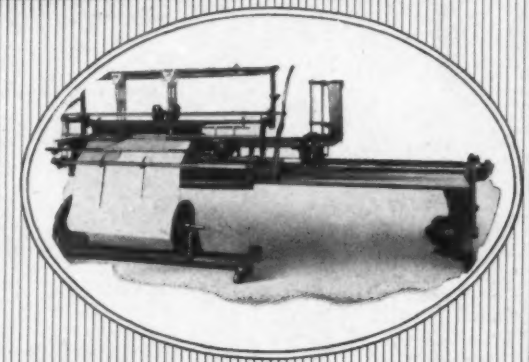
Taunton, Mass.

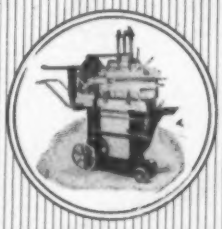
E. Howard, Southern Agent, Greenville, S. C.

BARBER-COLMAN

WARP TYING & WARP DRAWING MACHINES
HAND KNOTTERS







THE HOME OF BARBER-COLMAN
PRODUCTS VIEWED FROM AN AIRPLANE

BARBER-COLMAN COMPANY

HOME OFFICE & PLANT
ROCKFORD, ILL., U. S. A.

BRANCH
BOSTON, MASS.

BRANCH
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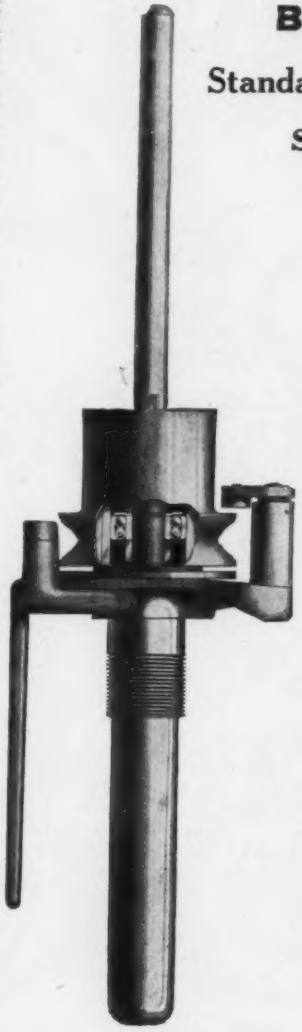
A New Source of Spindle Service



Ball Bearing Twister Spindles

Standard Type Spindles—with S K F Bearings

Sae Power—Increase Production

Ball Bearing **Twister** Spindles are not an innovation; many thousands are now in successful use. **Allen Spindles** interchange with any present type ring spindle. May we quote you on a trial equipment?

Inquiries Solicited

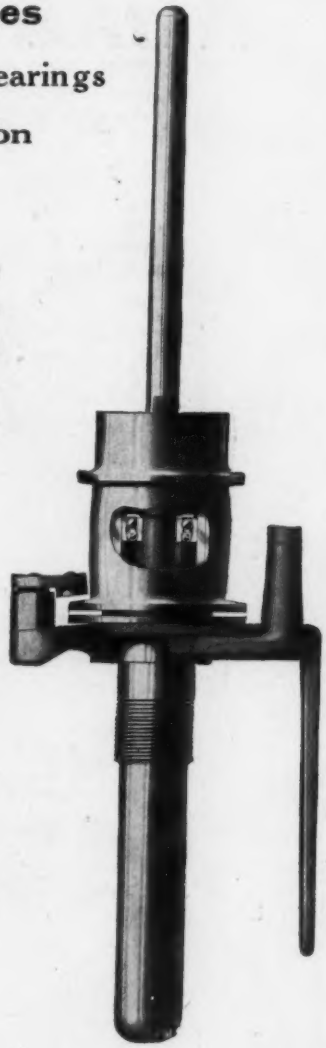
Is Stronger and **More Uniform Yarn** of value?

Are Large Twister Spools (5″x9″) efficient?

Is our **Research Work** worth investigating?

Do **You** want to **Speed-up** your present twisters?

Kindly forward sample spindle with your Inquiry.

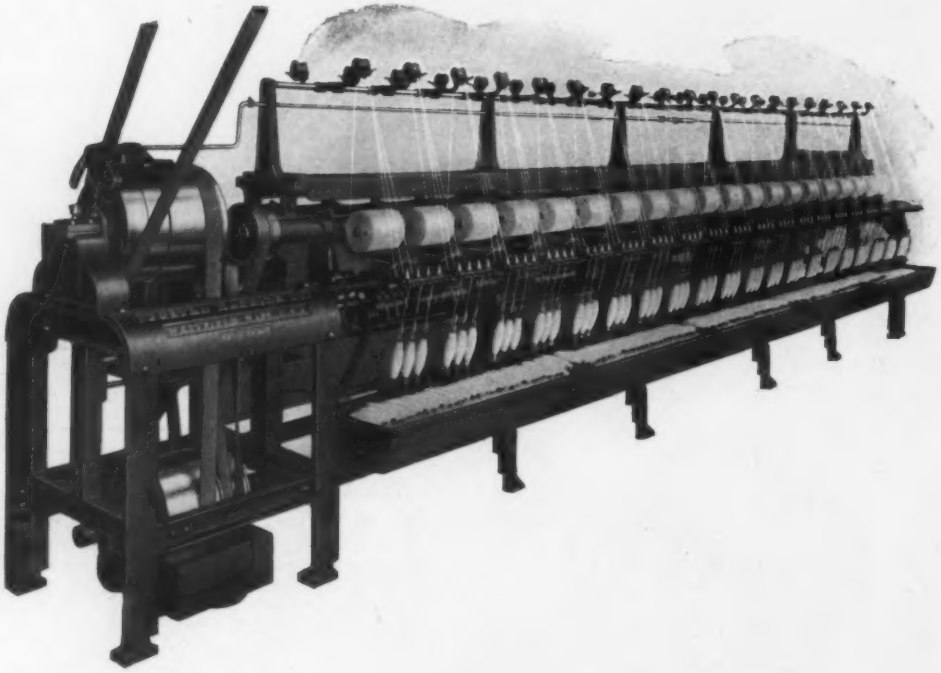


ALLEN SPINDLE CORPORATION

ELLIOTT A. ALLEN,
President and General Manager.

80 Boylston Street
BOSTON, MASS.

THE FOSTER DOUBLER



The Foster Doubler has been designed to simplify and perfect the important process of doubling yarn before twisting.

Its features are a precise trapping device and compensating tension that prevents slack-wound individual threads.

FOSTER MACHINE COMPANY

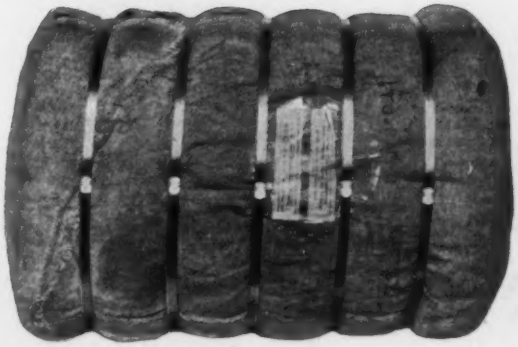
WESTFIELD, MASS.

JOHN HILL, Southern Representative, Healey Bldg., Atlanta, Ga.

ACME
NAILLESS
STRAPPING SYSTEM

For
BOXES
BALES
BUNDLES

It's
Fast
Efficient
Economical



Write for descriptive circular "C" and our catalog
of bale ties, buckles, box strapping, etc.

ACME STEEL GOODS COMPANY, Mfrs.

ATLANTA, 10 Tift Street
BROOKLYN, 167 41st Street
CHICAGO, 2840 Archer Ave.
NEW ORLEANS, Queen & Crescent Bldg.
PHILADELPHIA, 512 Arch Street

COTTON YARNS

For

KNITTING

Mercerizing, Weaving

In all Twists on Cones, Skeins, Tubes and Warps

36s to 80s, Single and Ply
Combed Peeler—Right Twist.

36s, 40s, 50s, Single and Ply
Double Guarded Peelers—Right Twist.

20s to 60s, 2, 3 and 4 Ply
Combed Peeler—Left Twist.

Each of these trademarks is a guarantee of highest quality yarn direct from the source of production to you.

Mills at
Gastonia, N. C.
Lincolnton, N. C.

J. L. Gray, *V.-P. and Gen'l. Supt.*
J. H. Separk, *Sec'y. and Treas.*

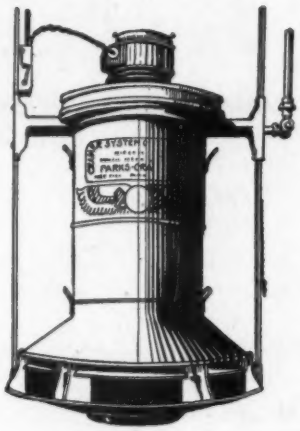
Our products are sold direct exclusively through General Sales Offices

H. A. FLORSHEIM

Sales Manager

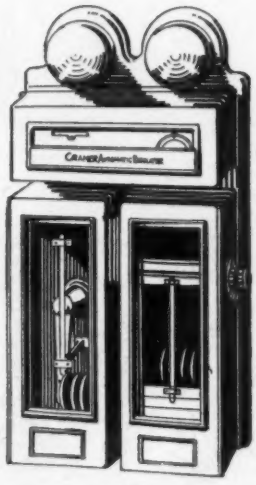
131 East 23rd Street, New York

Long Distance Telephone---812 Gramercy



Cramer
High Duty Humidifier

Are YOU Buying Humidity Scientifically?



Cramer
Automatic Regulator

Do You KNOW that your Humidifying System is developing exactly the proper amount of Humidification under every condition or have you simply installed "Humidifying Apparatus"?

The hit or miss method of turning the humidifiers off or on by guess—by feel—a universal practice up to within a few years—is rapidly giving way to equipment regulated scientifically and absolutely.

With the records of years of satisfactory performance of the best of three standard types of equipment at our disposal we are able to approach YOUR problem with an accumulation of unequalled scientific data.

Parks-Cramer Company

Engineers & Contractors
Industrial Piping and Air Conditioning

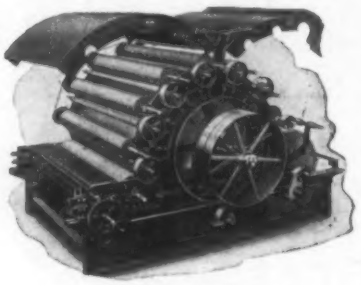
Fitchburg Boston Charlotte

SMITH & FURBUSH MACHINE CO.
PHILADELPHIA

Specialists in machinery for various kinds of WASTES. Builders of Carding and Spinning Machinery for Wool, Asbestos, Cotton-waste and other yarns spun on the wool principle.

Garnetts and Shoddy Machinery. Batt or Felting Machinery, Machinery for wiping and car-box waste.

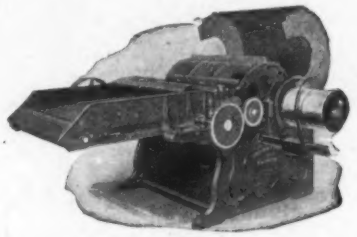
Complete equipments for Rewoven Gunny.



Cotton Waste Card

Ask for Circular S-165

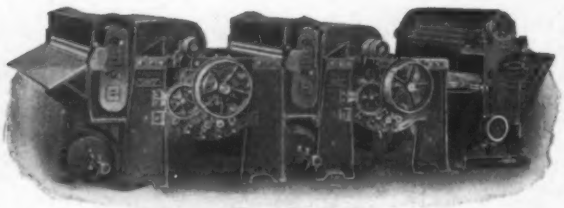
This is one of the carding units in a plant for making mop, cordage or other yarns from cotton waste.



Jute Picker

Circular S-166

This machine is used for opening Gunny and Burlap, forming a part of our equipment for the manufacture of Rewoven Gunny Bagging.

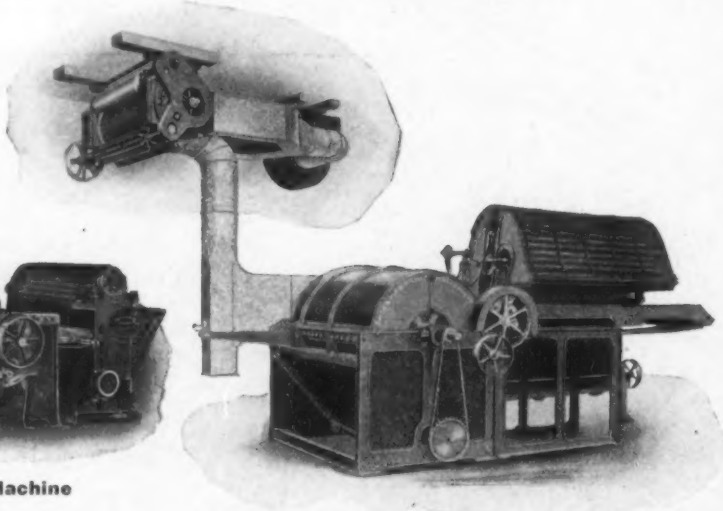


Cotton Waste Reclaiming Machine

(Shaughnessy Patent)

Ask for Circular S 90

The Shaughnessy Reclaimer does work not done by any other machine in recovering spinning fibre from low grade Cotton Wastes.

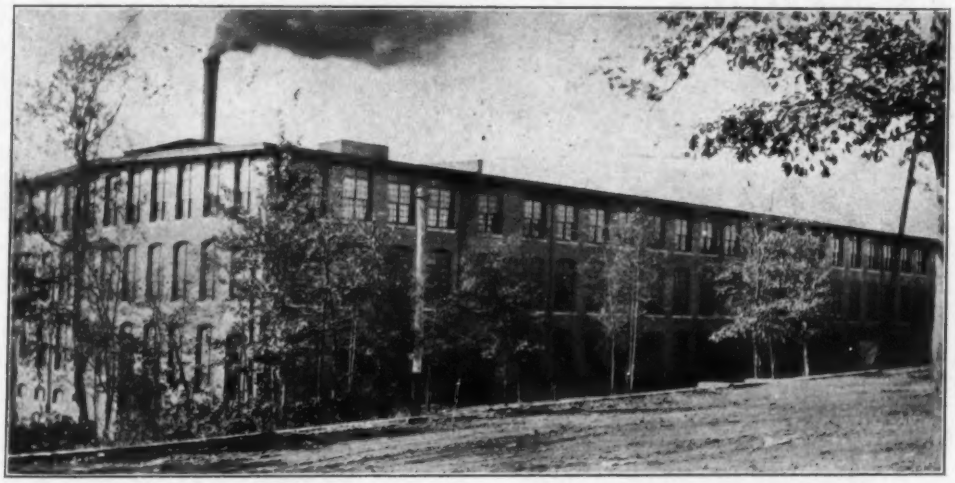


Continuous Outfit for Cotton Waste

Ask for Circular S 185

Our continuous Outfit removes the loose dirt, dust and bits of iron, wood, etc., from low grade Cotton Waste.

"Sirocco"
TRADE MARK



In Southern Cotton Mills

Old time methods are giving way to new ideas. Yesterday's plans are being thrown into the discard because it is realized that business today must be handled along different lines from that of the past.

In the Cotton mill and Textile plant conditioned air is playing a big part in production. A higher quality of product and more helpful employees is the rule in a plant equipped with Sirocco Air Conditioning apparatus.

If it is a question of ventilating equipment one of our Sales Engineers located near you will give you definite information as to how Sirocco equipment can be utilized for your needs.

American Blower Company

DETROIT, MICH.

FIG.20.

All our Baskets made from Lane Duck of our own weaving.
By use of strictly long staple cotton and approved modern methods, unusually high tensile strength and wearing qualities are obtained.

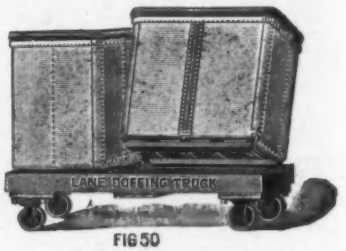


FIG 50

All frames made of highest grade Spring Steel, patented semi-flexible Eye-joints, affording a frame that YIELDS under strain instead of breaking or bending.

STURDY

Yet not an ounce of Superfluous Weight in

Lane Canvas Baskets

Standard American Equipment

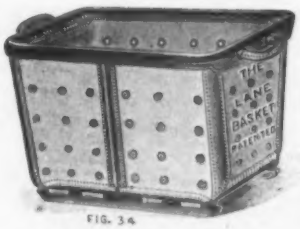


FIG. 34

Lane Steamers made in both oblong and round. Materials used withstand heat, moisture and handling to a degree found in no other basket.

Write for Catalog

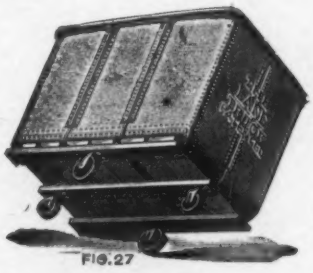


FIG.27

This truck embodies all the advantages of Lane Baskets, plus our specially designed Thread guard Casters which are, IN FACT, NON-CLOGGING. Furnished in either stationary or swivel frame style, of generous diameter and tread.

W.T. LANE & BROTHER, Manufacturers **Poughkeepsie, N. Y.**

STRENGTH with LIGHTNESS

FOUR million years ago nature determined the structural principles of strength with lightness in the development of all life forms.

Fossil skeletons of prehistoric animals show how identical these principles are with those used by industrial engineers today.

The high efficiency of utmost strength combined with minimum weight is now recognized as absolute in the manufacture of all industrial equipment.

KEYSTONE "PEERLESS" SEAMLESS ROVING CANS

are the strongest, longest-lived, toughest—*and lightest* roving cans made.

Exclusive methods of manufacture impart remarkable strength to Keystone Fibre.

Our roving cans are efficient, easy to handle, and will last years longer than any other roving can twice as heavy.

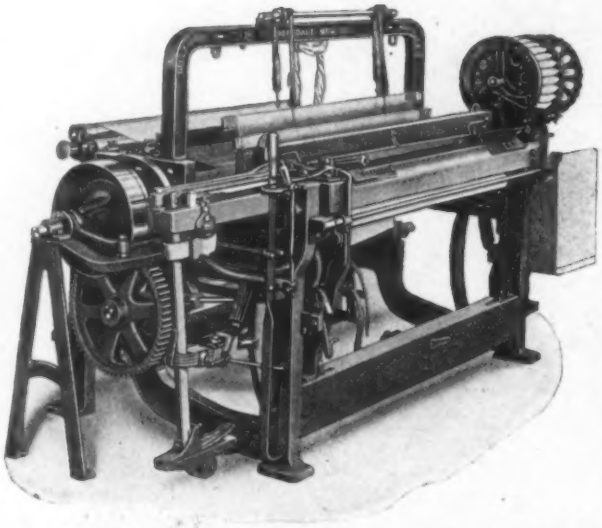
Order through your mill supply house.

Write for our book on Keystone Holloware Mill Equipment.

Keystone Fibre Company

Box 145, Yorklyn, Delaware

We Have Been in Business Some 7 Years



We think we have grown at a more rapid rate than has any other rival concern in a comparative period.

We increase to fill demands from satisfied customers.

HOPEDALE MANUFACTURING COMPANY

MILFORD MASS., U. S. A.

THE SIMPLEST AND THE MOST ELABORATE

FABRICS

Are produced on

LOOMS

From the

Crompton & Knowles Loom Works

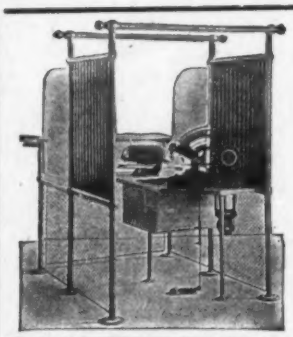
WORCESTER, MASS.

Providence, R. I. Paterson, N. J. Philadelphia, Pa.

Alexander & Garsed, Southern Representative, Charlotte, N. C.

The National Booth System Brings Efficiency Into The Mill

These Bring Real Efficiency to the Mill Village Laundry.



No. 1

The National Metal Marking Booth

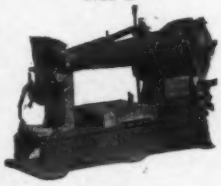
arranged with the National Lang Counting and List Printing Machine and the No. 8 National Power Marking Machine.

No. 2

Improved No. 8 National Power Marking Machine

Marks all classes of laundry work.

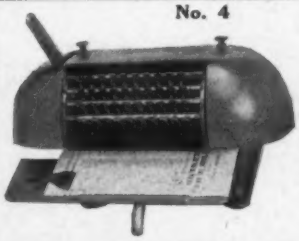
No. 3



The Rose Label, Tape and Patch Sewing Machine

sews previously marked identification tags to garments that cannot, or should not, be marked direct.

No. 4



The National Lang Counting and List Printing Machine

Counts and lists in one operation.

Because in addition to eliminating the 200 or 300 days lost each week when the workers remain home to do their family washing, they KNOW that every article sent will be returned.

Our Booths separate the markers—eliminate confusion—give each marker a sanitary "private office"—and make possible the handling of each piece with the minimum number of movements and NO CROSS-OVERS.

Every article is marked legibly, correctly and INDELIBLY with National Marking Machines. For best results, use our high-grade marking inks—never smudge, blur, run, get hard or gum.

Write TODAY for detailed information

Address Textile Department

The National Marking Machine Company

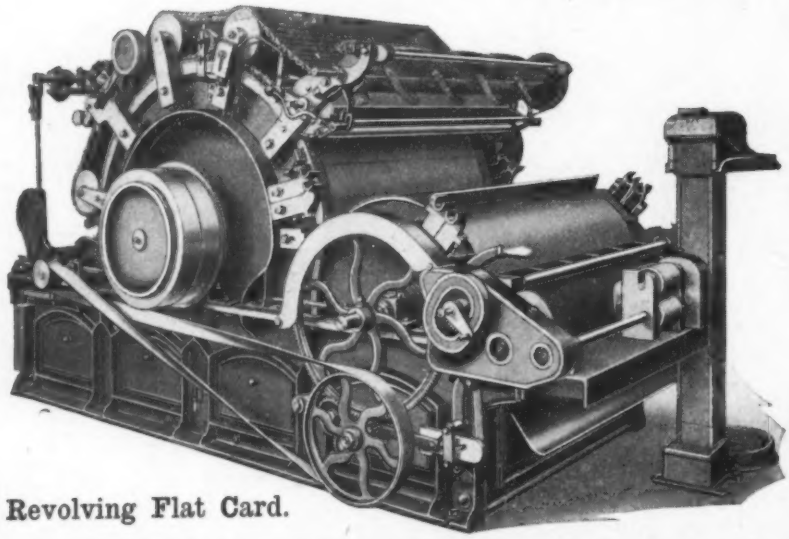
General Offices
1068 Gilbert Ave., Cincinnati, O.
New York Office: 40-44 West Fourth St., New York City.
Boston Office: 100 Boylston St., Room 722, Colonial Bldg.
Chicago Office: 6 E. Lake St., Suite 300.
Philadelphia Office: 125 N. 10th St.
Kansas City, Mo., 500 Delaware St.

Exclusive Agents for The Triumph Mfg. Co., Manufacturers of Bunker Marking Machines, Tabulators, Booths and Supplies.

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY



Revolving Flat Card.

Makers of
Machinery for
Opening, Preparing,
Spinning, Spooling,
Twisting, Reeling,
and Quilling
Cotton, Waste
and Wool Yarns.

Descriptive Catalogs
on Request.

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

SOUTHERN OFFICE CHARLOTTE N.C.

SPINNING RING SPECIALISTS SINCE 1873

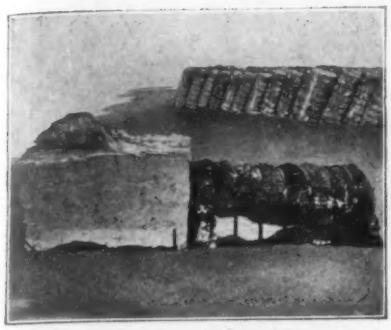
SPINNING RINGS
TWISTER RINGS
SILK RINGS

DIAMOND FINISH

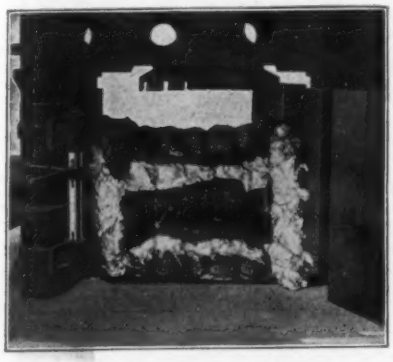
TRAVELLER CLEANERS
TRAVELLER CUPS
GUIDE WIRE SETS

WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.

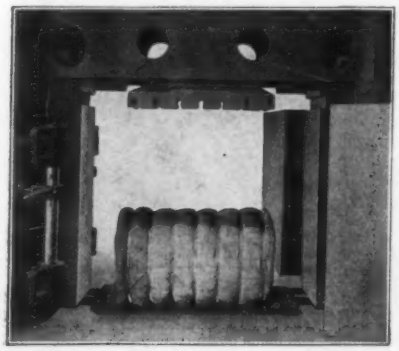
What the Spinners Want



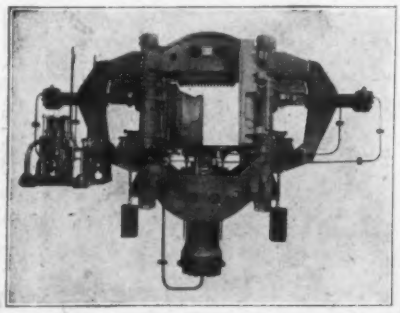
Showing resiliency of Southwark-Standard bale when opened—cotton uninjured.



Gin bale to be compressed to rectangular bale that requires least storage space.



Greatest pressure of only 450 tons makes density of 32 to 36 lbs. per cubic foot.



Just as the proof of the pudding is in the eating thereof, so the final test of the bale is in the spinning. To be a real success, a bale, in addition to saving freight costs, reducing storage space requirements, eliminating wastage, minimizing fire and weather hazards, etc., must meet the requirements of the spinner.

What do the spinners think of the hydraulically assembled and compressed bale—with a density of 32 to 36 pounds to the cubic foot, obtained by a maximum pressure of 450 tons—as compared with the 19 to 22 pounds to the cubic foot obtained by a 2000 ton blow under the old style method? We let a disinterested and unbiased spinner answer. The following letter by Mr. A. E. Sedyard, Secretary of the Pell City Mfg. Co., was written to Mr. T. R. Rennie, president of the same company regarding the

Better Preserved Cotton Baled by Southwark-Standard Compress

"While in Mobile I bought a lot of cotton and had it compressed on a Southwark-Standard Press. On arrival of this cotton at Pell City, it was carefully tested to note differences, if any, in the working and handling of cotton compressed by this system and that compressed by the usual method.

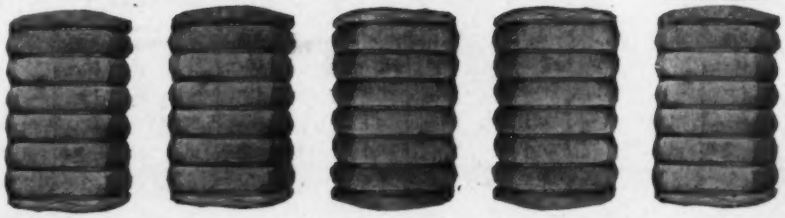
"I found on removing the bands, the bales pressed on the Southwark-Standard Press expand quickly. Five and one-half hours after removing the hoops, an old style bale expanded 20%. In the same time a Southwark-Standard bale expanded 70%.

"On examining carefully the staple of the cotton compressed by the Southwark-Standard Press, I found it in perfect condition showing no compress damage. In my opinion it is not possible for this press to injure the fibre in any way. Ten bales of this cotton was put through the machines in the mill and watched very closely to see if it offered any objectionable features, but failed to find them.

"Summing up my investigation—in my opinion the Southwark-Standard bale is a success in every particular. Because the ends of the bales are square and because of the higher density, these bales increase storage capacity approximately 50% as compared with the old system of compressing. Its method of compression makes injury of the staple impossible. If it has any objectionable features, I failed to discover them."

Best Bale all Along the Line

SOUTHWARK
FOUNDRY AND MACHINE CO.
ESTABLISHED 1836
PHILADELPHIA, PA.



Wooden Packing Cases

All Styles

Manufactured from
Georgia Pine
White Pine
Poplar
Cypress
and Gum

The interlocking packing case, shown in the upper left-hand corner, has advantages over other packages, especially for carrying heavy materials. In the first place lighter weight material can be used in its construction on account of the interlocking reinforcement. It is harder to pilfer or break open than other packing cases.

We are now in position to give all orders for shooks prompt attention, and will be glad to quote prices and delivery dates on any cases you might require.

In addition to rectangular tanks, we manufacture a complete line of round tanks equipped with round iron hoops and malleable draw lugs.

All our tanks are manufactured from heart cypress tank stock and we guarantee them to hold water.

Your inquiry solicited.

Hightower Box & Tank Co.

Corner Humphreys and Glenn Streets

Box 1025 **Atlanta, Ga.**

CUMMIN'S CAPACITY 70 BALES PER HOUR

MOVING the cotton crop of the South is one of the prime factors to be considered every year, i. e., to move it with the minimum expense and with the least possible loss of time, still keeping the staple in the best condition, but

The Problem Has Been Made Simple

BY

CUMMIN'S NEW PATENT HORIZONTAL HIGH DENSITY

End-Pressed Baling Press

This press is capable of compressing 56 lbs. to the cubic foot and is the real solution to the transportation problem so long a source of worry to the shipper. This means that a greater amount of cotton can be loaded per car than heretofore, hence requires fewer cars and gives each car its capacity maximum load weight.

ECONOMY

High Density Balage means the adjustment of freight rates to an equitable basis and also prevents useless waste of energy and materials now averaging nine figures behind the dollar mark annually and no cents. The methods of Yesterday must make way for the modern methods of Today, which is the demand in every line of industry.

From field to factory; from field to the railroad car; from field to the carriers of the sea, more cotton in the space formerly required has been the ever increasing cry. There has been but one logical way in which to procure this by improved baling methods, which has brought out and into a general use the Cummin's Baling Press.

STANDARD

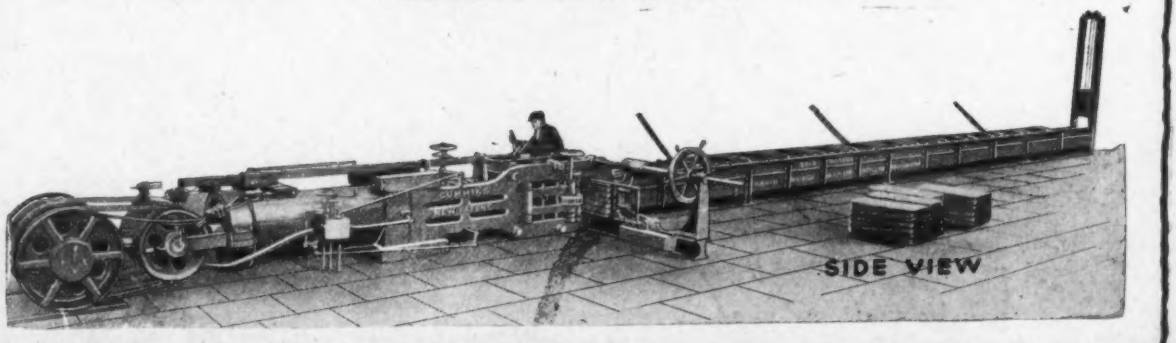
The cotton gin standardized the seeding of cotton, and in like manner Cummin's High Density Baling Press is surely standardizing the methods of baling. This piece of profit making machinery is as essential as the cotton gin and is here to stay. It is this density—uniform size—compactly and neatly tied bale —that pays in dollars and cents.

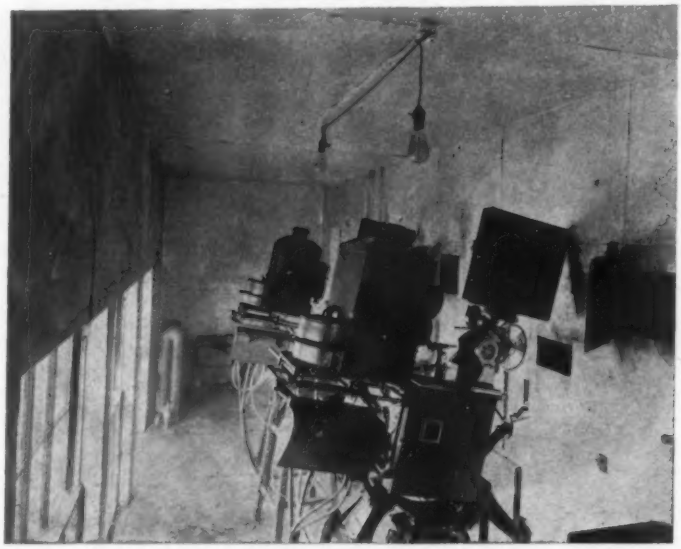
If you are interested in the future of cotton in America write for catalogue

W. D. CRUMPTON

American Representative,
29 Broadway, New York.

DAVID BRIDGE & CO., Ltd.
Manufacturers, Manchester, England





Showing Installation of Power's 6 B Motion Picture Machines in the Tucopou Mills Theatre

The Textile Industry Demands the Best

That is why—

More Power's Projectors are used by Cotton Mills in the South than all Projectors combined.

"We Have a Special Offer"

Our experience in Theatre equipment is at your service

Southern Theatre Equipment Company

No. Nine Nassau St.
ATLANTA, GEORGIA

Eighteen Fifteen Main St.
DALLAS, TEXAS

The Tax on Errors—Are You Paying it?

Do your figure-work on the Monroe and save the tax on errors

The bed-rock of sound business building is accuracy of figures. The present-day cost unrest demands the utmost of accuracy in all your figure-work. No one will consciously make an error in figuring. Yet errors will occur. To eliminate the hazard of figure-errors, do all your figure-work on the Monroe and get visual proof of the accuracy of your work.

—it multiplies

Extending invoices, figuring time cards, compiling payrolls, figuring chain discounts and the numerous other jobs of multiplying in offices of cotton mills are all handled easily, accurately and speedily on the Monroe. You will find a Monroe will multiply faster than the ordinary adding machine will add.

—it divides

Figuring cloth formulae, ascertaining percentage figures, computing costs, and other problems where dividing is necessary are quick work on a Monroe. Dividend, divisor and quotient—the three factors of your problem—are there before you and the most intricate division becomes the work of a few seconds with the backward turn of a crank.

—it adds

Footing ledgers, compiling reports, adding deposit slips, totalling sales figures—these and the hundred-and-one jobs of addition that are found in your office are all the work of seconds on a Monroe. The standard adding machine keyboard permits the rapid setting down of amounts and a simple forward turn of the crank does the rest.

—it subtracts

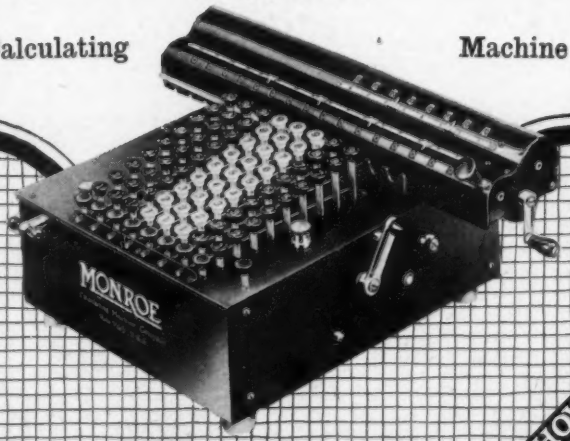
Deducting returns, proving the bank balance, checking allowances and the frequent problems necessitating subtraction are typical instances where a Monroe will save valuable time in figuring. Subtraction on a Monroe is direct—no complements, reciprocals or involved systems to contend with. Simply turn the crank backward and read your answer.

Ask for "Book of Facts"—or send in the Show Me Coupon and get a demonstration in your own office of how a Monroe will help you.

MONROE

REG. U. S. PAT. OFF.

Calculating Machine



The "SHOW ME" Coupon—Mail it today

Monroe Calculating Machine Co., Woolworth Bldg., New York

Without obligating us, (check item desired)
☐ Please send a copy of your "Book of Facts."
☐ Please arrange for a demonstration in our own office.

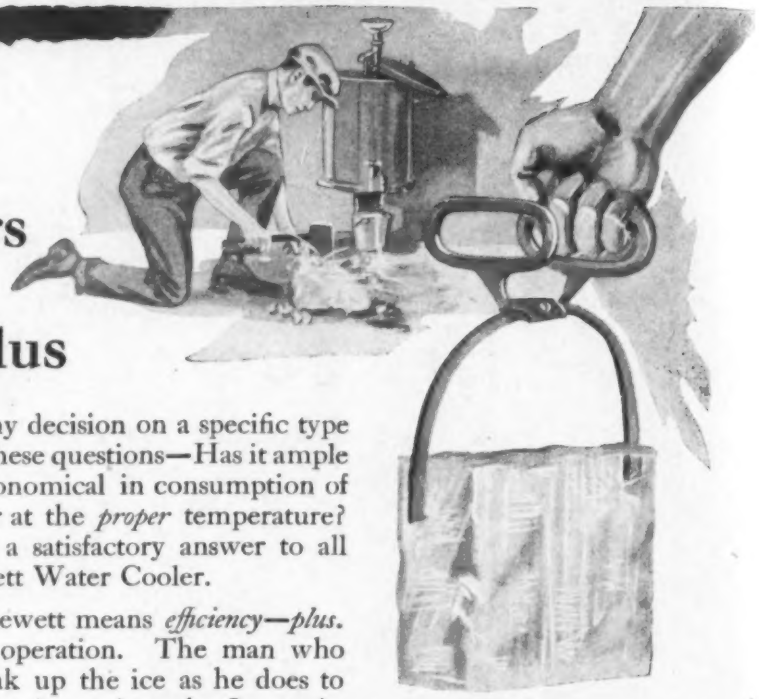
Firm Name.....

Your Name.....

Address.....

Cotton 5-20

The Square Design of Jewett Coolers Means Efficiency—Plus

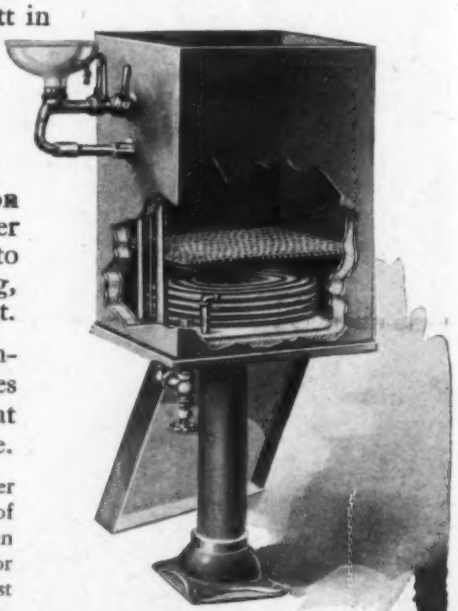


BEFORE you make any decision on a specific type of water cooler, ask these questions—Has it ample cooling capacity? Is it economical in consumption of ice? Does it supply water at the *proper* temperature? Is it sanitary? You have a satisfactory answer to all these questions in the Jewett Water Cooler.

The square design of the Jewett means *efficiency—plus.* It is filled with ice in one operation. The man who fills it doesn't have to break up the ice as he does to fill a round cooler. The ice is put into the Jewett in a solid cake. Cracked ice melts faster and piles up the ice bills.

Jewett Water Coolers

are the best insurance against summer production slumps. They dispense clean, cool, refreshing water that keeps your workmen fit to withstand the energy-sapping, vitality-destroying summer heat.



Jewett Water Coolers are staunchly built. Pure cork 1½ inches thick provides insulation that keeps *all* the coolness inside.

Many feet of coiled pipe allow greater cooling capacity and assure a free flow of ice-cooled water. No matter how often or how many men go to the Jewett for water, there is plenty and it is always just the right temperature.

These are some of the plants that use Jewett Water Coolers.

Alexander City Cotton Mills,
Alexander City, Ala.
Byron Shoe Mfg. Co.,
Hagerstown, Md.
Moore & Thompson Paper Co.,
Bellows Falls, Vt.
The Sharples Separator Co.,
West Chester, Pa.
Durham Cotton Mfg. Co.,
East Durham, N. C.
U. S. Radiator Corp.,
Detroit, Mich.
Brown-Lipe-Chapin Co.,
Syracuse, N. Y.
American Shipbuilding Co.,
The Beaver Board Co.,
Buffalo, N. Y.
Hodges Fibre Carpet Co.,
Indian Orchard, Mass.
The Dow Chemical Co.,
Midland, Mich.
Atlantic Steel Company,
Atlanta, Ga.
Pierce Arrow Motor Co.,
Buffalo, N. Y.
Davis Mills,
Fall River, Mass.
Vacuum Oil Company,
New York City

Jewett Water Coolers connect direct to your main water supply. The ice does not float and melt in water. Water from the Jewett's sanitary bubbler is *ice cooled,* not ice cold and the disease-spreading drinking cup is eliminated—important factors in health protection.

Jewett Water Coolers are assisting the organizations listed here in keeping their production normal during the summer months. We have some interesting facts and figures on this subject contained in several folders that we will gladly send you. Dictate a letter today and ask for this information.

THE JEWETT REFRIGERATOR CO.
Established 1849
23 CHANDLER ST., BUFFALO, NEW YORK

What Are Motion Pictures Doing for Your Industry ?

THEY are teaching employees, by the thousands, the many phases of industrial activity. They are condensing entire plants, complicated systems of distribution, and the mechanics of organization to a few square feet on a screen. They are bringing workers and executives together on a basis of mutual understanding. They are promoting a new education which can never flow from a book. And this is only a part of the mission Motion Pictures are filling.

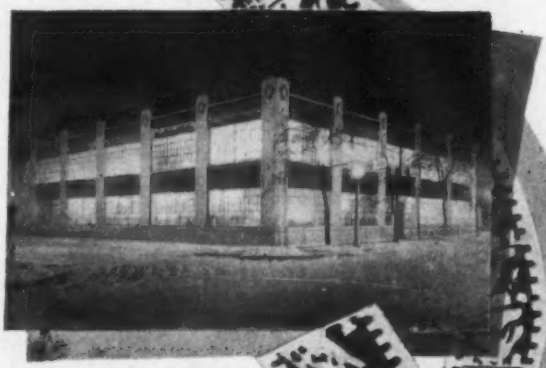
If you have neglected to know these facts, or if you consider them vague, ask for the evidence willingly given by those whom Motion Pictures have served.

Our Entire Organization, its members carefully and judiciously selected, will cooperate with you from the initial survey of requirements to the completed treatment of the subject. If Motion Pictures will prove a profitable investment, you should know it now. We do not recommend our services unless they are to be of definite measurable value.

Complete information will be sent to executives of the Textile Industry. Find out NOW what Motion Pictures are doing for the Industries.

Consultation without Obligation.

The Senior Specialists In Motion Picture Advertising.



Established 1910

Rothacker FILM MFG. CO. CHICAGO U.S.A.

1343 Diversey Parkway Chicago Illinois

Eastern Industrial Division 220 W. 42nd St., New York

HELP *your* HELP

and they will satisfy you

Provide Proper Recreation

---billiards and bowling
a clean sport

To exercise RIGHTLY *Means To PLAY!*

Bowling is the sport where you can PLAY and EXERCISE any old time —and regardless of the weather.

Let us Advise and Assist YOU in Providing

Recreation

that will
Keep YOU and YOUR EMPLOYEES

Physically Fit

Write for full information.

The Brunswick-Balke-Collender Co.

623-633 South Wabash Avenue
CHICAGO, ILLINOIS

Branches in All Cities

BILLIARDS BOWLING

INTERNATIONAL TIME & COST RECORDERS

You Pay For a Job Time Recorder Whether You Use One or Not

Dependable Cost Systems can be obtained only through Accurate Job Time Records. It is vitally important to know to the minute how much time is spent on each job. Without interruption of your present cost system

INTERNATIONAL JOB TIME RECORDERS

furnish a mechanically printed record of the amount of time spent by each employee on each job or operation.

Such a record reveals in detail lost time and helps increase production.

Used conjointly with INTERNATIONAL TIME RECORDERS, which provide a record of the time when each employee arrives and leaves, INTERNATIONAL JOB TIME RECORDERS complete the time records of the entire organization. This simplifies the work of cost and time keeping, insures accurate payrolls and promotes harmony.

International Time Recording Company

GENERAL OFFICES: 50 Broad Street, New York. WORKS: Endicott, N. Y., Toronto, Can.

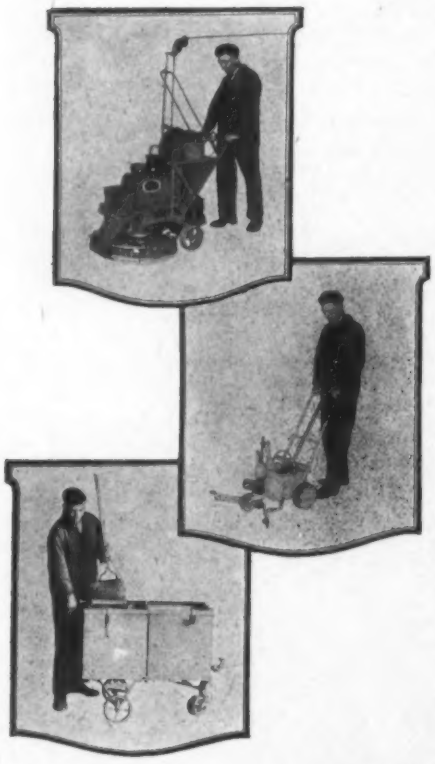
Canadian Office: International Business Machine Co., Ltd. 300 Campbell Avenue, Toronto

London Office: 57 City Road Finsbury, London, E.C., England

Paris Office: 75 Avenue de la Republique Paris, France

Offices and Service Stations in All Principal Cities of the World

Cleaning Crews



---and the Cleanest Mill in America

A battleship deck, though apparently clean, must be scrubbed every day. The work of scrubbing is distributed among the entire crew, each man doing only a small allotment of the deck's area.

But the scrubbing method of battleships is impracticable for textile mills.

Yet one hundred per cent cleanliness on the large scale of the U. S. Navy is necessary. Every floor should be thoroughly clean. Finnell scrubbed floors are. Textile cleanliness is profit insurance. In the clean mill, machinery lasts longer, fabric soilage is reduced, and a better type of worker is assured.

Many American textile mills are getting consistent 100% cleanliness by using the Finnell System of Power Scrubbing. The ambition of each to be the "cleanest mill in America" effects radical economies in improved production and producers.

The right combination of Finnell units for your mill is ready for you. Full information will be cheerfully sent on request.

American Scrubbing Equipment Co.

General Offices: 180 N. Wabash Ave., Chicago. Factories: Hannibal, Mo.

DISTRICT OFFICES

Atlanta	Buffalo	Denver	Los Angeles	Newark	Philadelphia	Salt Lake City
Baltimore	Chicago	Detroit	Louisville	New Orleans	Pittsburgh	San Francisco
Boston	Cincinnati	Indianapolis	Milwaukee	New York	Providence	Seattle
	Cleveland	Kansas City	Minneapolis	Omaha	St. Louis	

FINNELL SYSTEM

OF POWER SCRUBBING

The Truck that picks up the Load

The work of the extra helper or loader is eliminated when a McKinney One-Man Truck is used. That extra helper who used to be so necessary in loading boxes, bales and barrels can be put to work somewhere else—made a real producer. One man with a McKinney One-Man Truck can handle any trucking job alone!

The McKinney System furnishes your truckers with an extra pair of hands. It cuts your trucking and labor expense in half because it requires only half the number of men to do the same amount of work. Then, too, your trucking is done in much less time and with less effort.

Notice the illustration! The steel package holder gripping the box does the work the extra helper used to do. It enables one man to easily pick up, haul and unload heavy and bulky packages without a single stroke of assistance.

McKinney One-Man Trucks are of light, rugged construction, easily operated and suitable for handling any kind of merchandise under all kinds of trucking conditions.

McKinney One-Man Trucks are more popular today than ever before. The demand for labor is great. It costs too much to have two men doing a job one can do just as well. The extra men whose work is handled by the McKinney Trucking Service can be placed at work in other important departments.

Our illustrated catalog, "The One-Man Method" will answer your particular trucking problem. Send us your name and address and we will forward you a copy of this interesting booklet.

McKinney Manufacturing Co.
Pittsburgh
THE LOVINGOOD COMPANY
14 WALKER STREET, ATLANTA, GA.

Also manufacturers of McKinney Hinges and Butts, garage and farm building door-hardware and furniture hardware.

McKINNEY *one-man* TRUCKS

This is the Age of More Efficient Hauling Methods

Don't trail on the tail-end of progress. Today—EVERYWHERE—we see newer and more efficient methods of hauling.

Foremost is the Storage Battery Locomotive. It adapts itself to the haulage problems of the cotton industry, and does the work of a dozen men, quicker, cheaper and better.

Manufacturers, plant managers, and those who figure cost **know,** that production is increased, high priced labor shortage overcome and more men released for other work by installing

Industrial Locomotives

equipped with

Edison Storage Batteries

THESE locomotives can be used in places where fumes, hot cinders and exhaust gases would prohibit other means.

For this hard service Edison Batteries deliver sure, dependable service, day in and day out.

The *Steel* and *Iron* construction of Edison Batteries guarantees a service that makes them the standard for this work—because—they give the highest service efficiency, year in, year out.

Bulletin 608 AD will show you Edison-equipped Locomotives that have proved their value in many industries.

A copy is yours for the asking!

Edison Storage Battery Co.

Factory and Main Office: **Orange, N. J.**

Distributors in

New York Boston Chicago Detroit Cleveland Seattle
San Francisco Los Angeles Denver Kansas City
New Orleans Atlanta Washington Philadelphia Pittsburgh
Scranton Buffalo New Haven St. Louis

FIRST

in Variety of Uses

The uses of White Trucks are so varied and widespread that there is literally no transportation undertaking in any line of business in which they have not had a part.

in Long Mileage Records

There are numerous owners' records of 100,000 miles, many of 200,000 miles and some of 300,000 miles.

in High Earning Power

The earning power of White Trucks results from low costs and high performance, without a parallel in motor trucking so far as we have any records.

in Fleet Installations

No fleet record of truck owners has ever been published which compares in extent or progressive growth with the White Annual Roll Call.

in Service to Owners

Millions have been invested in White owner service and factory facilities built up throughout the country, which have taken years to perfect.

THE WHITE COMPANY, *Cleveland*

White Trucks

Elwell-Parker Electric Truck Does the Work of Ten Hand Trucks.

You Need Better, Cheaper, Quicker Transportation Around Your Mill

This can be accomplished by installing Elwell-Parker Electric Trucks. One of them will enable one man to accomplish 5 to 10 times the work he did with a hand truck —and do it even quicker.

Moving Raw Cotton or Cotton Fabrics

from place to place—between departments—to the shipping room—and the great amount of other haulage—fuel, ashes, etc.,—are items of expense too important not to be carefully considered.

Our engineers will fit one—or as many—types of Elwell-Parker Electric trucks as you mill may require. They will study your needs and show you how to meet them. We have installed them in many parts of the world—and in every case they have speedily paid for themselves.

Our trucks can be worked in close quarters, and are easily operated. Fifteen to 20 miles on one battery charge. Interlocked control makes them safe anywhere in the mill.

Constructed of steel—Capacity, any load up to two tons.

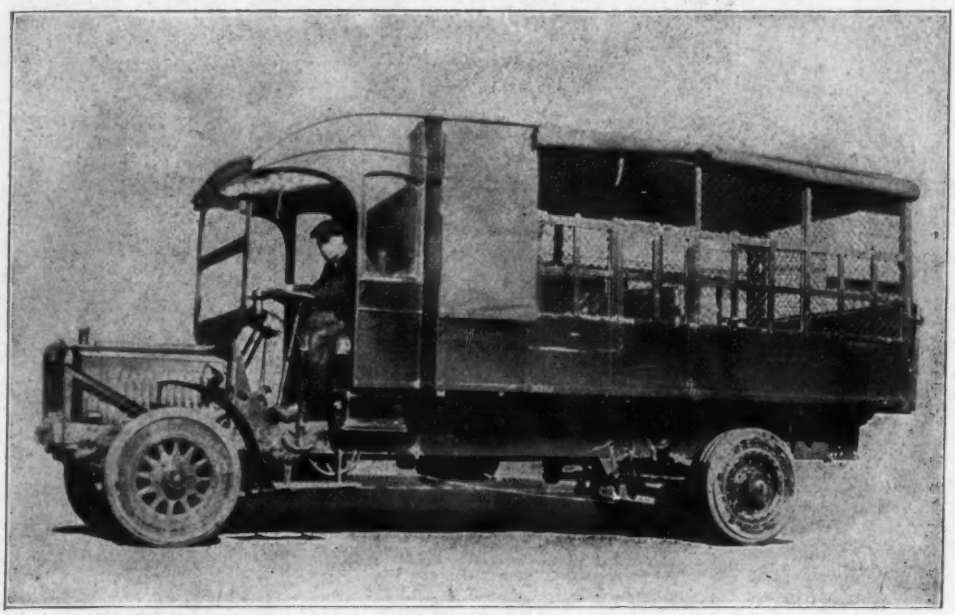
Write for full details and our handsome catalogue.

The Elwell-Parker Electric Co.

Pioneer Builders of Electric Industrial Trucks

CLEVELAND, OHIO

New York	Newark	Cincinnati	Chicago	Kansas City
Boston	Jacksonville	Birmingham	Detroit	San Francisco
Philadelphia	Pittsburg	Nashville	Milwaukee	Seattle
New Haven	Buffalo	St. Louis	Denver	Montreal



The longer life and more economical upkeep of a Packard, as compared with the average truck, reflects the remarkable grade of steel used in its construction—a steel produced to meet a fixed engineering standard—let the cost fall where it may.

Is the Textile Manufacturer Missing an Opportunity to Cut His Costs

WITH the greatly increased dependence of the Textile Industry upon motor truck transportation—the far-sighted manufacturer is attaching the same importance to trucking economies as to savings in manufacture.

As with any mill operation, he is keeping accurate records on his trucks to find out just what his hauling costs are, and how they may be reduced.

The Packard people do not pretend to authority on any subject except *transportation*. But they *can* show the American business man *records of savings in trucking costs*—10 per cent in gasoline, 18 to 22 per cent in time, up to 30 per cent in ton-mile cost.

They can show him, too, how to apply the same methods to *his own business*.

Packard has done away with excess costs in gasoline, not only through the remarkable ability of the Packard Truck Engine, but especially by means of the Packard *carbureter*.

Here is a carbureter built especially to stand the vibration of a truck at work. The float feed positive and *precise*. The carbureter water-jacketed and mounted high up on the cylinder *bloc;* so that the gas is warmed by the motor, and fed to the engine ready to flash into power.

Packard does away with excess friction and oil wastage, by the precise and positive *alignment* of parts from end to end of transmission.

It saves oil again by the *close fitting* of pistons and rings—and by preventing loss of oil through drip.

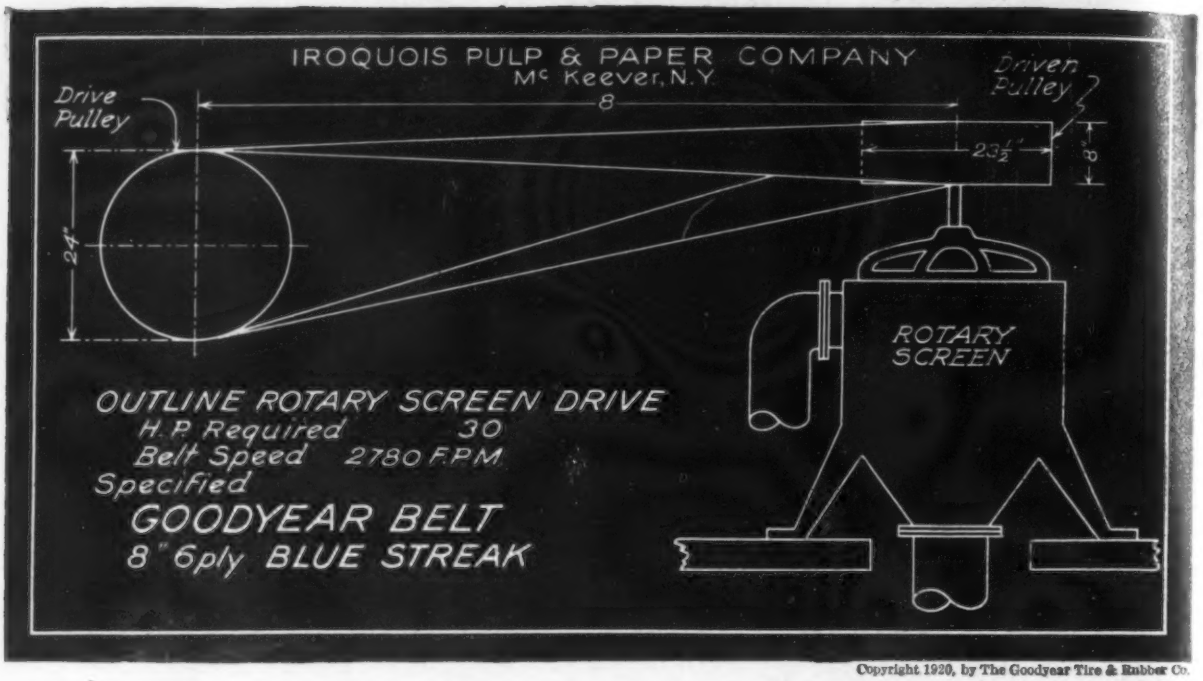
It saves tires by *distribution of load*, by the positive and uniform action of the clutch—in fact, by the engineering design of the *whole Packard rear end*.

Dynamometer tests on Packard Trucks show that the Packard delivers 86 per cent of the *Engine-power* to the rear wheels on *low gear*, and 94 per cent on *high*.

These engineering facts give the Textile manufacturer an accurate prediction of what the Packard can do in his own business.

"Ask the Man Who Owns One"

PACKARD MOTOR CAR COMPANY, *Detroit*



Copyright 1920, by The Goodyear Tire & Rubber Co.

20% More Production—and the G. T. M.

A quarter turn on short centers, a heavy crown pulley, and the presence of considerable moisture where the belt had to work, kept the Iroquois Pulp & Paper Company, of McKeever, New York, buying a new belt every 30 days for their rotary screen drive. That was before the G. T. M.—Goodyear Technical Man—analyzed the drive to determine what belt would do the best work and last the longest time on it.

The G. T. M. based his recommendations not on the fact that he was a Goodyear man and had belts to sell, but on his practical knowledge of belting, plus a careful study of every feature of each drive. He figured in all the factors that affected belt performance and life—30 horsepower to be transmitted, a drive from a 24-inch pulley on a line shaft to a 23½-inch pulley on the rotary screen, a quarter turn on short centers—only 8 feet—a speed of 2,780 feet per minute, and a heavy damp prevailing all the time.

An 8-inch, 6-ply Goodyear Blue Streak met the requirements. Its friction surface held the pulleys in a firm grip that prevented slippage and transmitted full power. Subjected to the heavy moisture, it did not stretch. To the severe strain imposed by the duty on the quarter turn it responded with inbuilt strength and flexibility.

Four months of Goodyear Blue Streak service—you will recall that previous belts wore out at the rate of one a month—not only cut belting cost by 50% but also established an operating record of 20% increase in production. The men and machines were going on with their work instead of waiting while the rotary screen had its belt taken up again.

A plant analysis which included a detailed study of every drive in the Iroquois plant was made at Supt. Archie Brown's suggestion, when the G.T.M. dropped in to see how the Goodyear Blue Streak was working. In line with the same scientific method of conserving and utilizing the full energy of the plant, the Company has installed Goodyear Hose and Goodyear Packing, confident of the same economical, long-lived service from them as from their Goodyear Belt.

If you have a belt problem, involving either a single drive or an entire plant, there is something of value for you in the Goodyear analysis idea. The G. T. M.'s time and experience are at your service. You may rely on the ability of any Goodyear product he specifies to do more and better work, over a longer period of time, at lowest final cost.

BELTING · PACKING · HOSE · VALVES

GOODYEAR

S K F Industries Wants Worries

—that is, the BEARING worries of the American manufacturers who are searching for means of maintaining quality in the face of rising costs and raw material shortages.

To give the public what it wants—quality production in quantity delivery—is calling in many instances for re-adjustments of design, changes in material specifications and manufacturing methods.

And such problems of production, so far as they concern BEARINGS, S K F can take from your shoulders with the assurance of immediate help.

For not only has the S K F Institution developed the anti-friction bearing to its highest perfection, but also, S K F has established a scientific research and engineering organization that can place in your designers' hands the sum total of the knowledge of bearing application and design.

Manufacturers are invited to avail themselves of this freely offered cooperation.

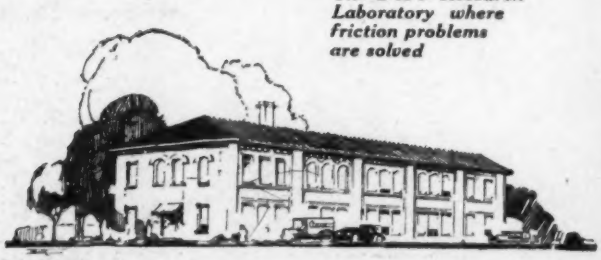
S K F INDUSTRIES, INCORPORATED
Sales, Service and Research Division
165 Broadway, New York

590

SKF INDUSTRIES

Hess-Bright Ball Bearings
S K F Ball Bearings
Atlas Steel Balls
Gronkvist Chucks
Transmission Hangers

The S K F Research Laboratory where friction problems are solved



Cocheco

A belt cut from the strongest, heaviest part—the center part—of selected steer hides; tanned—every inch of it—by the slow, white oak bark process; curried, stretched and finished by experts of a lifetime training in our shops; these are the features that come to your mind when you see the word—**Cocheco.**

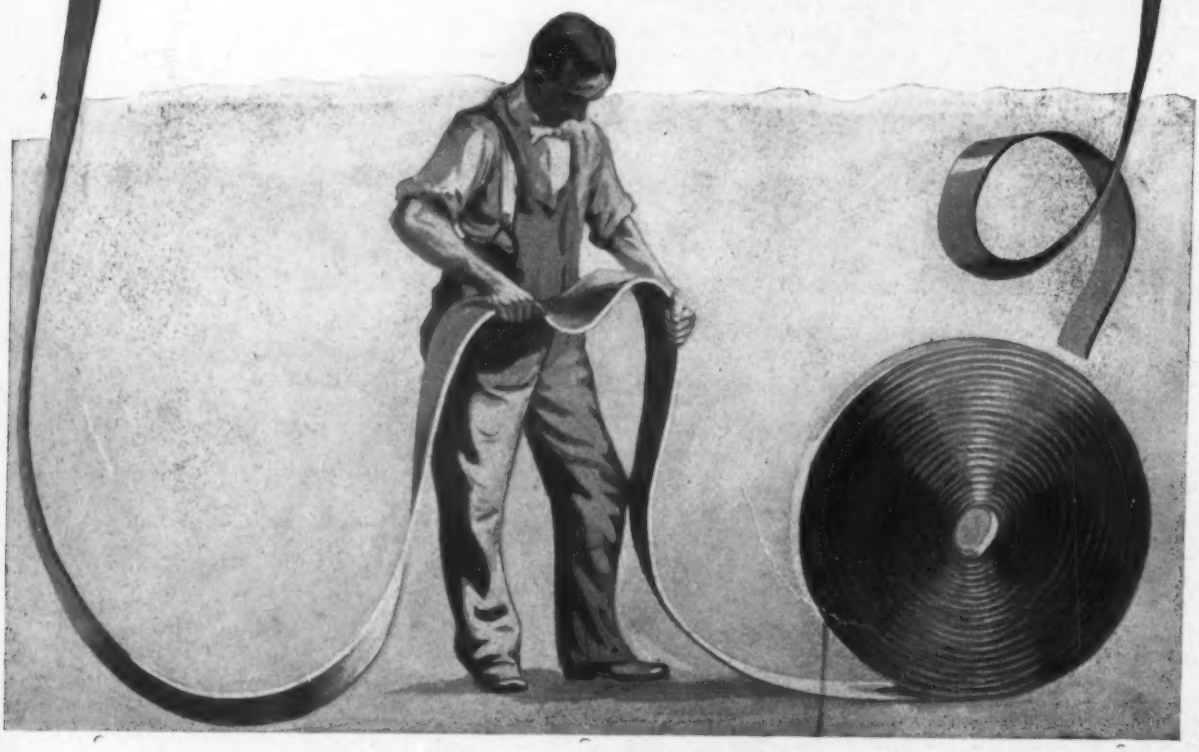
For the last word in belting is **Cocheco.** 75 years' experience go into its making. No wonder we can afford to offer a money-back-if-not-as-represented guarantee. No wonder that in many instances Cocheco has served for twenty years and more.

Do you know the Cocheco story?
You'll find our catalog valuable.

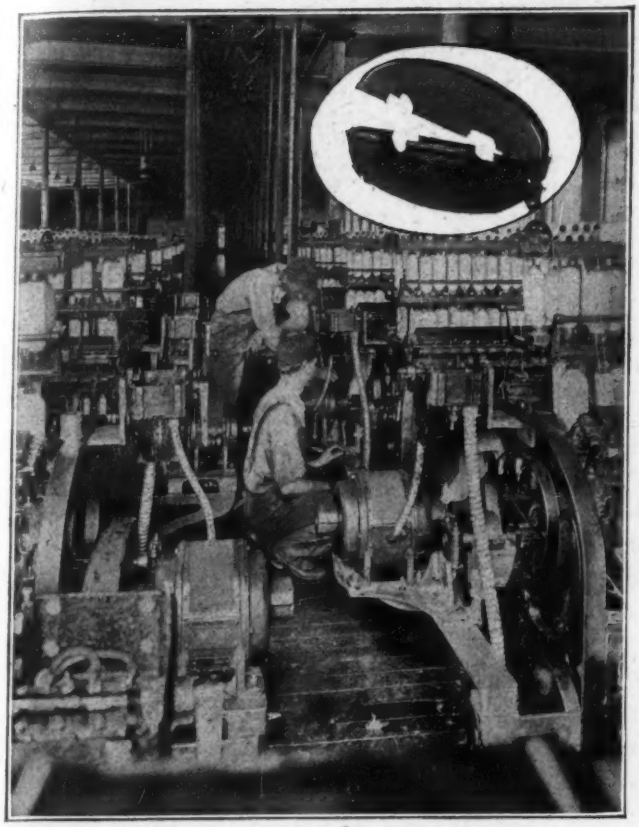
I. B. WILLIAMS & SONS

Dover, N. H.

157 Summer St., Boston 71-73 Murray St., New York 14-16 N. Franklin St., Chicago



INCREASING PRODUCTION
WITHOUT SHUTTING DOWN TO CHANGE OVER



Changing over, SAXON MILLS, Spartanburg, S. C.
J. E. Sirrine, Mill Engineer and Architect.

Showing an alley of Spinning Frames in the Saxon Mills running by belt drives while some are being changed over to individual motor drives with Morse Rocker Joint Chains encased in pressed steel chain-cases (similar to insert at upper right corner.)

No Resetting or Altering of Frame Required

Note the free passage allowed between machines in this mill with wide aisle. By the use of this special motor bracket, it is possible to put in this individual motor equipment either with 5 H. P. or 7½ H. P. motors where the frames are spaced as close as 36¼ inches.

"One of the ways of increasing production is by securing uniform speed. "I think we get better results with silent chains than with any other form of Drive." From address, J. E. Sirrine.

The Drive of Efficiency

MORSE CHAINS

The Drive of Durability

Positive as Gears — *Flexible as a Belt*

Longer Life

enable mills to excel in production and efficiency of operation and result in lower manufacturing costs. Why not

INSTALL THEM NOW

To replace belts or gears and eliminate worry and insure constant production and maximum rate.
MORSE ROCKER JOINT CHAINS lighten the burden of mill operation, assure 98½% efficiency of driving power, will run cool and require no oil bath.
Our Engineering Organization is at your service without obligation.
Write Today for Technical Textile Booklet

See Exhibit Oil Mill Sup'ts Exhibit

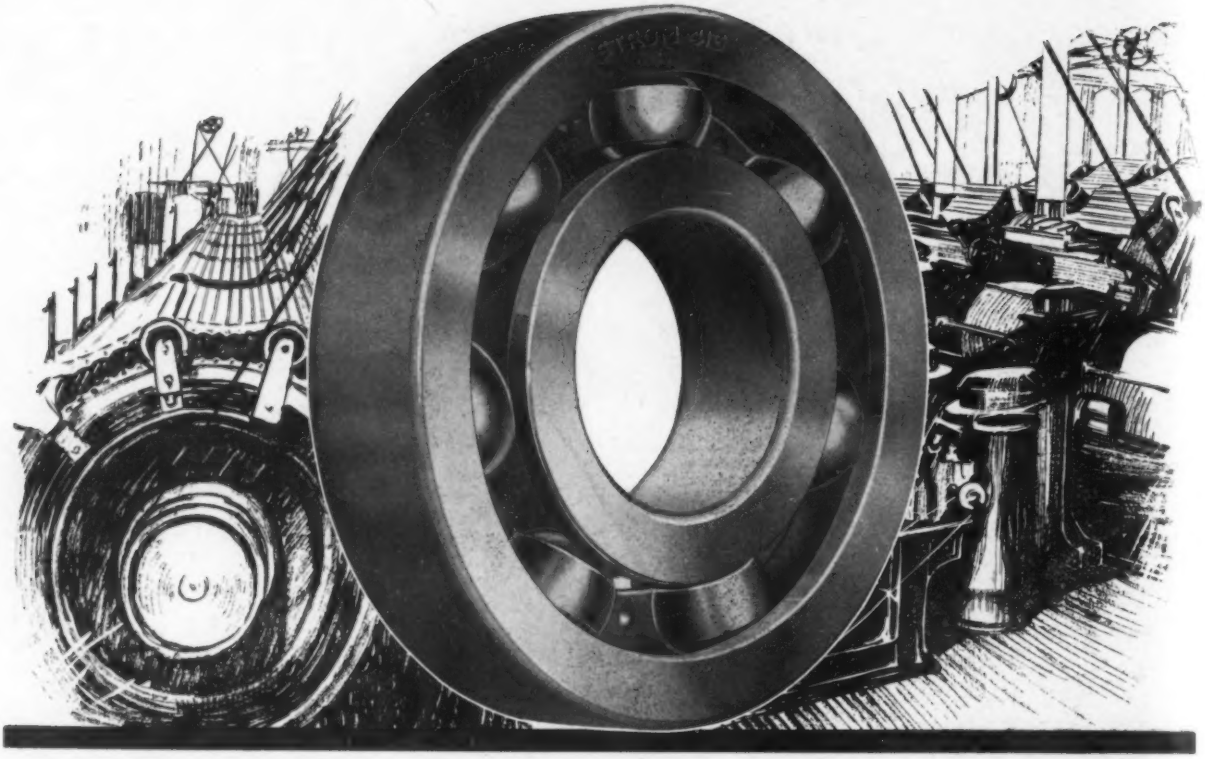
MORSE CHAIN CO., LARGEST MANUFACTURERS OF SILENT CHAINS IN THE WORLD Ithaca, N. Y.

Morse Engineering Service — *Assistance Without Obligation*

Address Nearest Office

BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS.....141 Milk Street
CHARLOTTE, N. C., 404 Com'l Bank Bldg.
CHICAGO, ILL., Merchants L. & T. Bldg.
CLEVELAND, OHIO.....Engineers Bldg.
DETROIT, MICH.....1003 Woodward Ave.
NEW YORK CITY.....50 Church St.
PITTSBURGH, PA.....Westinghouse Bldg.
PHILADELPHIA, PA.....302 Harrison Bldg.
SAN FRANCISCO, CALIF.....Monadnock Bldg.
ATLANTA, GA., Candler Bldg.....Earl F. Scott, M. E.
CANADA.....Jones & Glasco, Regis'd.
MONTREAL, St. Nicholas Bldg.....Toronto, Traders' Bk. Bldg.
KANSAS CITY, MO., Finance Bldg.....Morse Engineering Co.
MINNEAPOLIS, MINN., 413 3rd St., S....Strong-Scott Mfg. Co.
ST. LOUIS, MO., Chemical Bldg.....Morse Engineering Co.

"Morse" is the Guarantee Always Behind the Efficiency, Durability and Service



Strom Bearings Reduce Operation Costs

In the textile industry, Strom bearings have proved themselves to be a real economy.

They save power, oil, time, labor, materials, practically eliminate maintenance expense, and greatly reduce fire hazard.

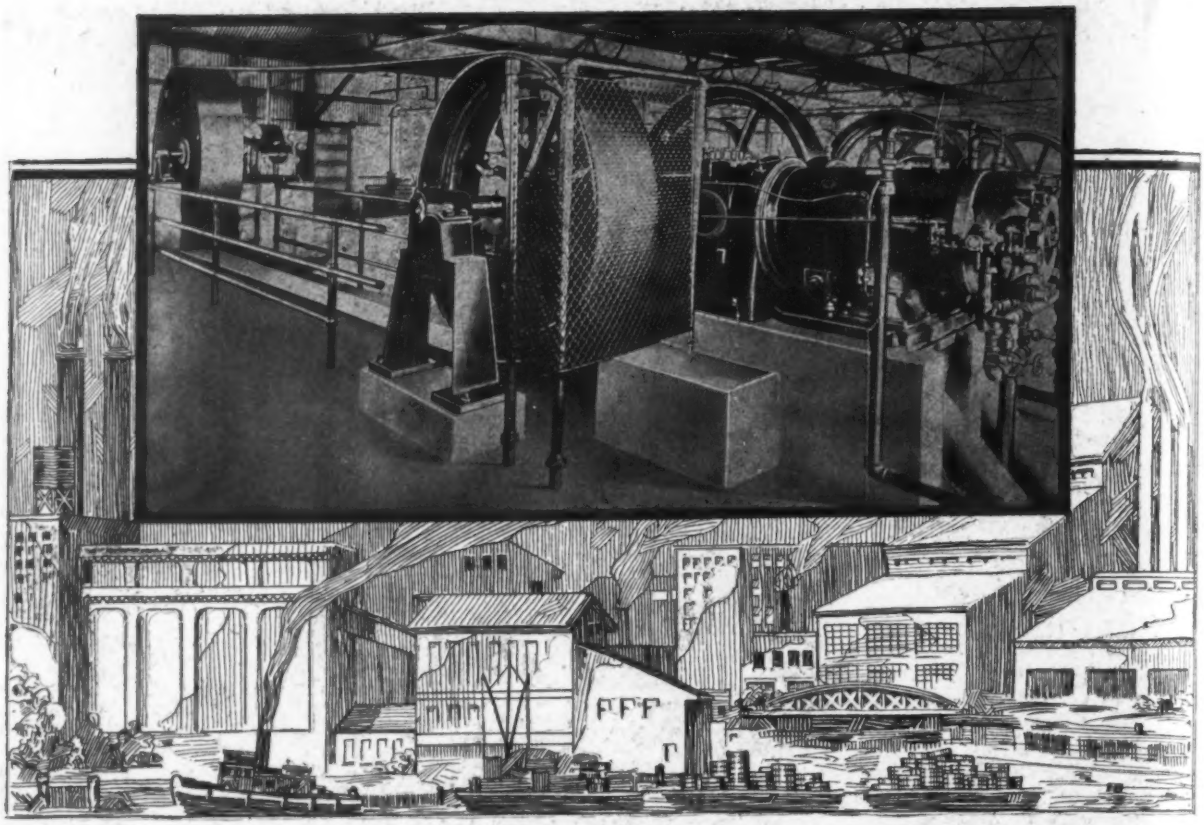
The high quality of Strom bearings together with their superior design and construction has been established in the textile machinery field.

The correct installation of your bearing equipment is a specialized engineering problem which calls for expert advice. Our bearing engineers will be glad to give you this advice if you will afford them the opportunity.

U. S. BALL BEARING MFG. COMPANY
(Conrad Patent Licensee)
4535 Palmer St., Chicago, Ill.

Strom BEARINGS

"Pioneer"
STEEL HANGERS
Have Taken
The Hard
Work Out
of Shaft
Hanging
There was a time when hanging shafting was a back-breaking job.
Now it is different—because "Pioneer" Steel Hangers weigh about one-third as much as the old-style cast iron.
The cost of the millwrighting is also very materially reduced and the "Pioneer" does not break—Never.
Its price is no higher.
Ask for a copy of our new booklet "Transmission Data". Contains some plain truths worth reading.
STANDARD PRESSED STEEL CO.
PHILADELPHIA, U. S. A.



Production—that's the big thing needed now—"limit" production, from men and machines and plants. There must be no weak link in the chain from power to productive machine—energy must flow, uninterruptedly. Inadequate, unreliable belting, and poorly designed drives, cut down production—they have no place in modern industry. They increase expense, curtail output. The House of Ladew stands ready to aid—with leather belts of time-tested reliability and with belting engineers skilled in applying these belts to best advantage. Is poor belting holding down your production?

EDW. R. LADEW CO., INC.
GLEN COVE, NEW YORK, U.S.A.
Since 1838

Branches and Distributors in All Principal Cities of the World Carry Complete Stock.

Ladew

AP-45

"How Often Do You Oil the Machine?"

"EVERY day," says Smith. That's because the oil he uses keeps constantly leaking out of the bearings.

"Once a week," says Robinson. That's because he uses NON-FLUID OIL.

NON-FLUID-OIL **stays in the bearings**—until entirely used up, putting a constant check on friction.

With NON-FLUID-OIL the customary intervals between oilings can be stretched several times—a saving of labor as well as lubricant.

No spattering oil, means no oil-stained goods. That's a further reason for using NON-FLUID-OIL.

Most textile mills are using NON-FLUID-OIL now—
Soon they'll all be

Write for free testing samples and find out why

NEW YORK & NEW JERSEY LUBRICANT CO.,
401 Broadway, New York
Ample stocks at our branches:
Atlanta, Ga. **Charlotte, N. C.**

TRADE MARK REGISTERED IN
NON-FLUID OIL
UNITED STATES PATENT OFFICE

Casings and Lubrication

for

Silent Chain Drives

IT comes to our attention now and then that some Silent Chains are operated without the use of lubricant. We are sometimes confronted with the question therefore—"Can Link-Belt Silent Chain Drives run without oil? And why do you recommend the use of casings for your drives?"

It is a principle of practical mechanics that any chain drive will run better, last longer and require less attention if it operates through an oil bath in a tight casing, than if it runs exposed, with little or no oil.

Silent Chains—all makes—being composed of many links and joints, and run at high speeds, require oil—just like other machinery. To contend that this is untrue violates a "first principle" in the operation of machinery.

But remember this — Link-Belt Silent Chains run just as well without casings or lubrication as any other make of Silent Chain. However, we will not sell a Link-Belt Silent Chain Drive if we know it is the intention to operate it without lubrication.

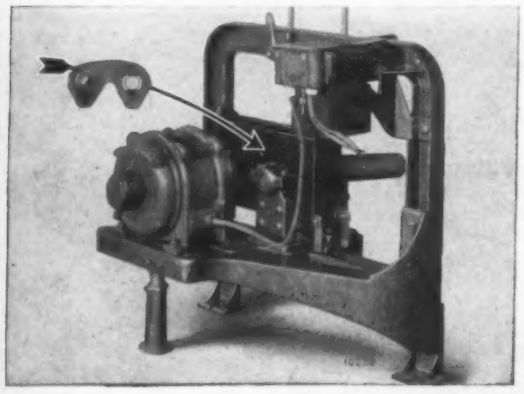
A watch needs oil. An engine runs smoothly if well lubricated. Any moving parts will work easily, without undue friction or noise, if properly designed and well lubricated. The fact is so elemental and so well established, particularly with those in mechanical occupations, that it precludes argument on the subject.

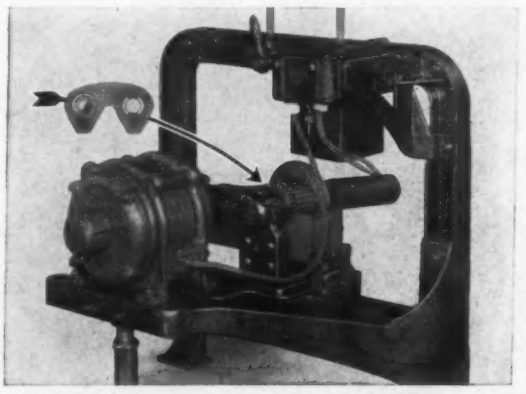
We have always recommended the generous use of lubricating oils on our drives. Many of our customers tell us they scarcely know our Silent Chains are used in their mills—and in nearly all such cases we find the reason is because some practical superintendent is careful to oil not only the drives, but all the operating machinery. The wise use of lubricant is one of the best practices in any mill or factory.

Casings having our oil-tight and dust-proof seals permit the use of Silent Chain Drives in places where, without them, it would be inadvisable to employ Silent Chain Drives. Many Link-Belt Silent Chain Drives so equipped are running successfully today even in Cement Mills. We insist that all our drives be run in oil-tight, dust-proof casings for this character of work, and then, and only then, can we fully guarantee their satisfactory operation. We are insuring the durability and satisfactory operation of our Drives by insisting upon the use of oil and advocating the use of casings—it is the obvious thing to do.

Safety-first is a watchword in the modern mill today. Casings make for absolute safety—they completely cover all moving parts, and are often worth their small additional cost for this feature alone. Employes feel a sense of security around covered machinery.

We welcome suggestions, and are always ready to explain by personal interview any printed statements which may not be entirely clear.





LINK-BELT COMPANY

518

PHILADELPHIA

New York	299 Broadway
Boston 9	49 Federal St.
Pittsburgh	1501 Park Bldg.
St. Louis	Central Nat'l Bank Bldg.
Buffalo	547 Ellicott Square
Wilkes-Barre	2d Nat'l Bank Bldg
Huntington, W. Va.	Robson-Prichard Bldg.

CHICAGO

Cleveland	429 Rockefeller Bldg.
Detroit	730 Woodward Ave.
Minneapolis	618 S. Third St.
Kansas City, Mo.	306 Elmhurst Bldg.
Seattle	576 First Ave., S.
Portland, Ore.	First and Stark Sts.
San Francisco	582 Market St.

INDIANAPOLIS

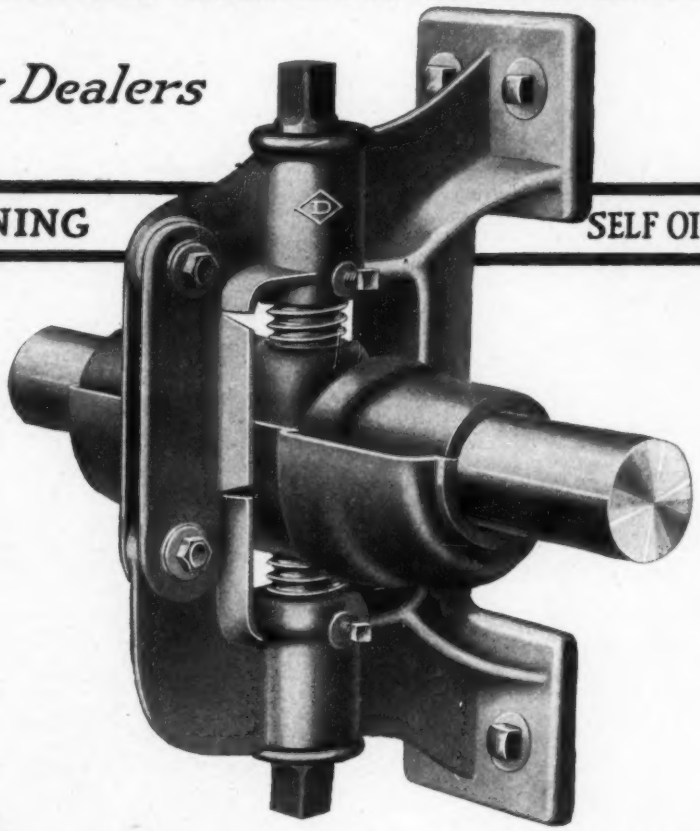
Los Angeles	168 N. Los Angeles St.
Toronto, Can.	Canadian Link-Belt Co., Ltd.
Denver	Lindroth, Shubart & Co., Boston Bldg.
Louisville, Ky.	Frederick Wehle, Starks Bldg.
New Orleans	C. O. Hinz, Hibernia Bank Bldg.
Birmingham, Ala.	S. L. Morrow, 720 Brown Marx Bldg.
Charlotte, N. C.	J. S. Cothran, Com'l Bank Bldg.

Dodge Post Hangers

ADJUSTABLE BALL AND SOCKET TYPE

Sold by Dealers

SIDE OPENING **SELF OILING BEARINGS**



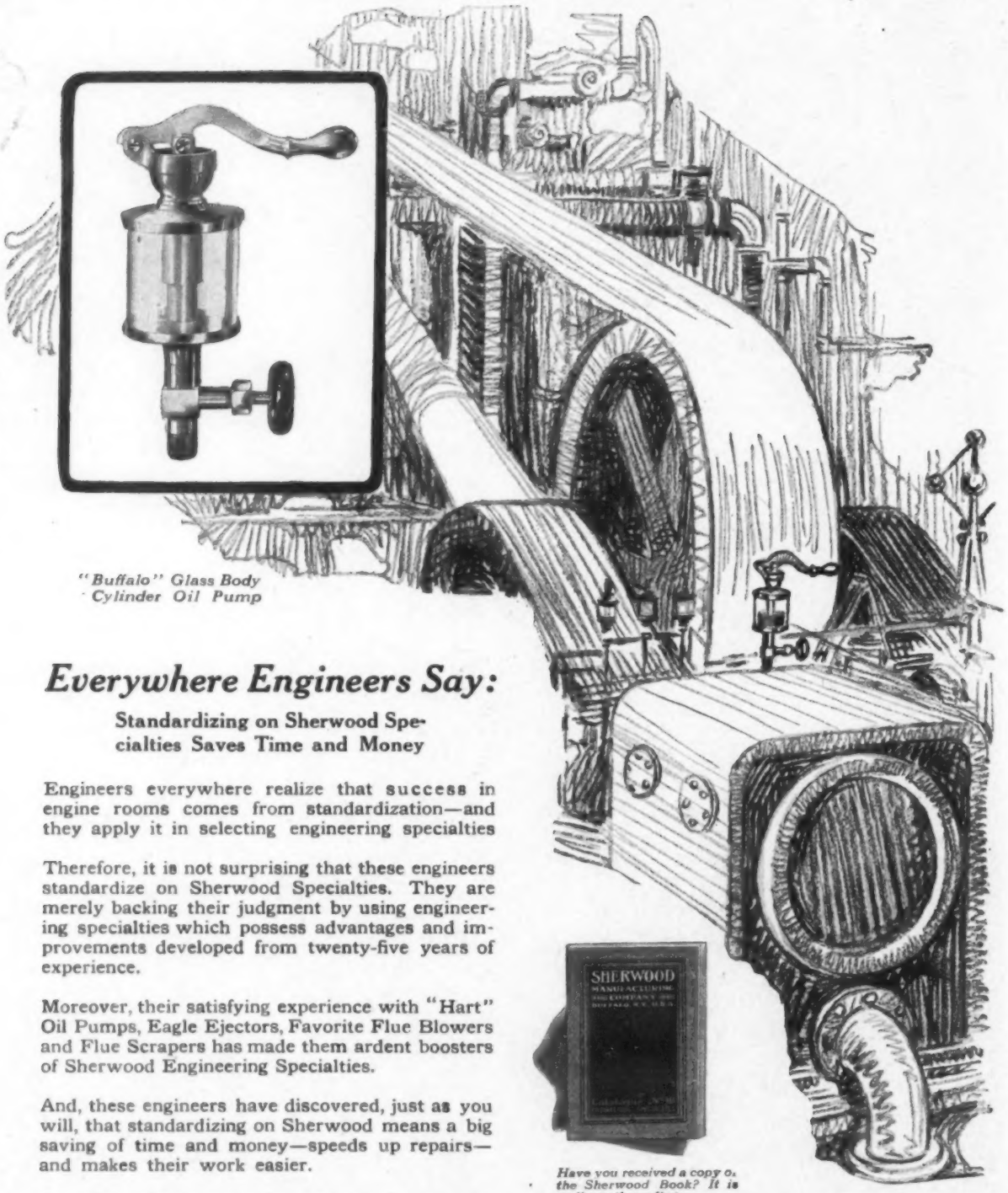
Dodge hangers are designed to eliminate, as far as possible, vibration and friction. They are the very foundation of a "roadbed for power." The ball and socket fitting insures alignment of the bearing with the varying motion of the shaft. The side opening makes the millwright's work easy and permits accuracy of erection.

You will find a complete stock of hanger and bearing line at your dealer's—order from him direct at a delivered price.

DODGE

Dodge Sales & Engineering Company, distributor of the products of the Dodge Manufacturing Company and the Dodge Steel Pulley Corporation. General Offices: Mishawaka, Ind. Works: Mishawaka, Ind., and Oneida, N. Y.
Canadian Plant: Dodge Mfg. Co., of Canada Ltd., Toronto and Montreal

Philadelphia Cincinnati New York Chicago St. Louis Boston Atlanta Pittsburgh Minneapolis Dallas Providence Seattle Newark



"Buffalo" Glass Body Cylinder Oil Pump

Everywhere Engineers Say:

Standardizing on Sherwood Specialties Saves Time and Money

Engineers everywhere realize that success in engine rooms comes from standardization—and they apply it in selecting engineering specialties

Therefore, it is not surprising that these engineers standardize on Sherwood Specialties. They are merely backing their judgment by using engineering specialties which possess advantages and improvements developed from twenty-five years of experience.

Moreover, their satisfying experience with "Hart" Oil Pumps, Eagle Ejectors, Favorite Flue Blowers and Flue Scrapers has made them ardent boosters of Sherwood Engineering Specialties.

And, these engineers have discovered, just as you will, that standardizing on Sherwood means a big saving of time and money—speeds up repairs—and makes their work easier.

SHERWOOD MANUFACTURING COMPANY
Brass Founders and Finishers
BUFFALO, N. Y.

Have you received a copy of the Sherwood Book? It is well worth reading.

—Write your name and address on the margin of this page, forward it to us, and we will send the Sherwood Book to you by return mail.

C-5

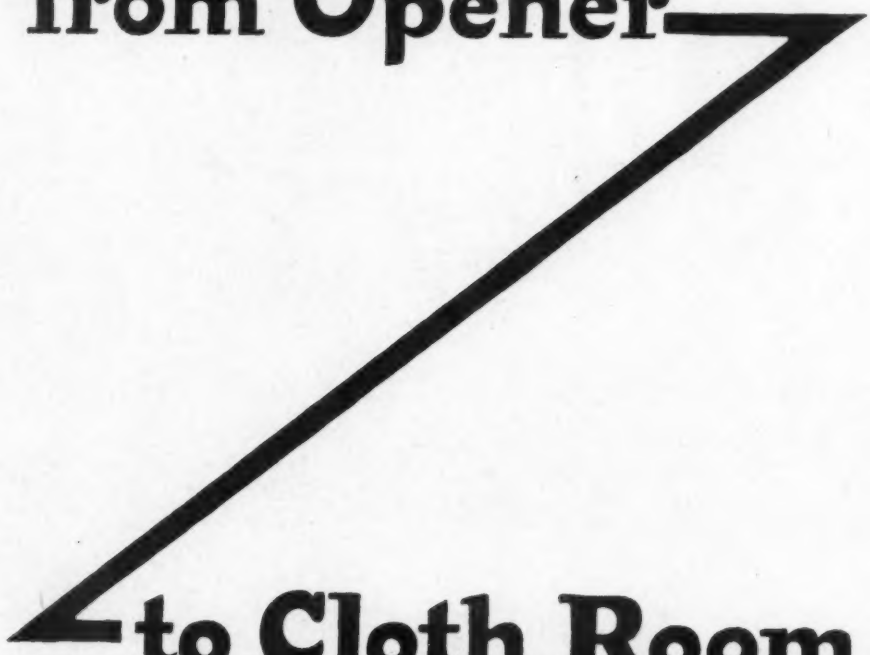
SHERWOOD
ENGINEERING-SPECIALTIES

there is a Texaco Lubricant

for every mechanical appliance

in the mill-

from Opener



to Cloth Room

—as well as in the Power Plant.

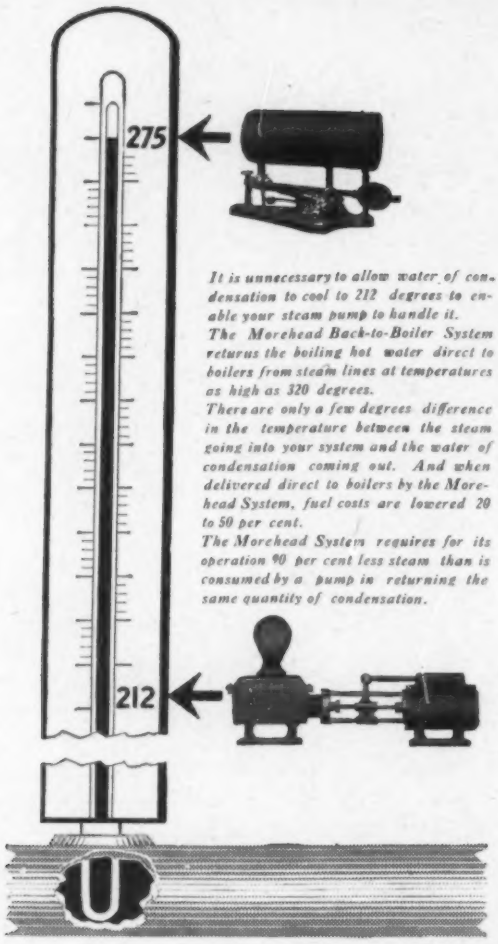
Consultation** with Texaco Lubrication Engineers Regarding any or all of your Lubricating Requirements is **Invited.

The Texas Company

Dept. O, 17 Battery Place, New York City

New York Chicago Houston

Offices in Principal Cities.



It is unnecessary to allow water of condensation to cool to 212 degrees to enable your steam pump to handle it.
The Morehead Back-to-Boiler System returns the boiling hot water direct to boilers from steam lines at temperatures as high as 320 degrees.
There are only a few degrees difference in the temperature between the steam going into your system and the water of condensation coming out. And when delivered direct to boilers by the Morehead System, fuel costs are lowered 20 to 50 per cent.
The Morehead System requires for its operation 90 per cent less steam than is consumed by a pump in returning the same quantity of condensation.

Make Your Heat Units Produce

With fuel scarce and high priced—with the necessity for burning the cheaper grades of fuel perhaps facing you, steam plant performance indeed becomes a subject requiring careful consideration.

Whether you use the cheaper or the best grades of fuel—sawdust, slack or mine run—make sure that no heat units are wasted in your plant.

The Morehead Back-to-Boiler System keeps steam-heated equipment in operation at top speed by removing all condensation as it forms in steam lines.

Let us refer you to steam plants similar to your own, where the Morehead System has speeded up production, reduced coal consumption—effected savings that paid for the installations the first few weeks.

Morehead Manufacturing Co., Detroit, Mich.

Canadian Morehead Manufacturing Co., Woodstock, Ont.

The "Morehead" Return Trap.

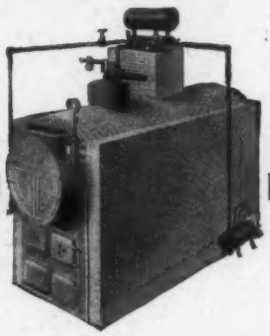
Positively Drains All Types of Steam Apparatus

Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature

Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"



Morehead System is Profitable Investment

Wysong & Miles Company
Greensboro, N. C.

Mr. Grant Estlow,
Graham, N. C.

Dear Sir:—

We are pleased to advise that we have been operating a Morehead Steam Trap for the past six or seven years, that we have had no record of its having given us a moment's trouble, that we are well pleased with it and consider it a profitable investment, and we have no hesitancy in recommending it.

Hoping that you will be successful in effecting many sales, we beg to remain,

Yours Very Truly,
WYSONG & MILES CO.
J. A. Kleemeier, Secretary.

The above letter, addressed to the Morehead Manufacturing Company's Southern representative, is conclusive evidence that this automatic back-to-boiler system gives dependable, never faltering service.

Let us send you complete information regarding the Morehead Back-To-Boiler System. Write for our catalogue and list of Southern mills where the Morehead System has reduced fuel bills 20 to 50 per cent.

Morehead Manufacturing Company
DETROIT, MICHIGAN.
Canadian Morehead Manufacturing Co., Woodstock, Ont.

The "Morehead" Return Trap.

Positively Drains All Types of Steam Apparatus

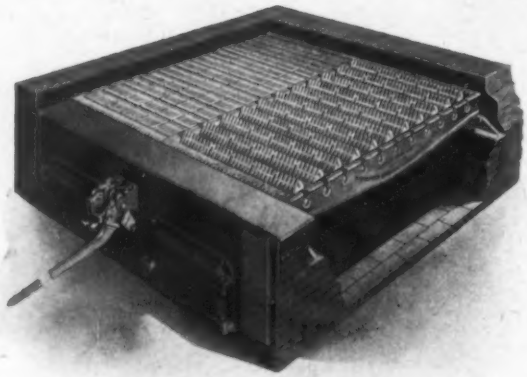
Delivers Condensation And Feed Water to Boiler Under All Conditions at Maximum Temperature

Your Fuel Bills are Less

Morehead

"BACK-TO-BOILER-SYSTEM"

MacDonald SHAKING GRATES



Perfect Combustion With Less Fuel

Here's a perfect grate that will help you to lower costs in your boiler room and produce a free steaming boiler.

There are several reasons for the superiority of the MACDONALD Shaking Grate—

1—Unrestricted air passages. 2—Fool-proof locking device. 3—Fuel cannot be wasted when grate is being shaken. 4—Powerful leverage for shaking and breaking up clinker. 5—Grates may be repaired or renewed at negligible expense by replacing top sections only. 6—Detachable top sections may be changed to give any desired air opening or spacing of grate. 7—Proper distribution of metal gives the greatest strength possible in proportion to weight of the material. 8—When shaken the maximum irregularity of depth of vibration is given without opening a wide space between sections. 9—A flat grate locked in position so that the surface cannot be left uneven or with points projecting into the fire.

Top sections which make it unnecessary to replace an entire expensive bar when a portion of it wears out. Maintenance expense is therefore cut to the bone.

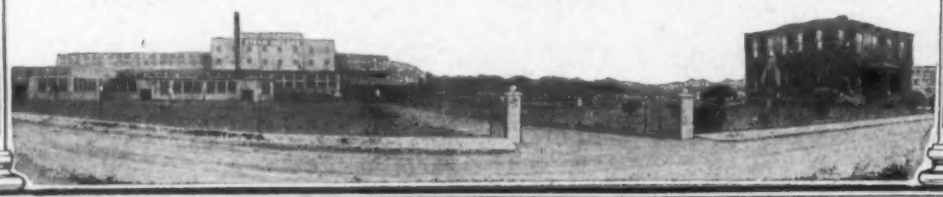
Let us tell you more about this perfect coal-saving grate, and how it will save you money.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

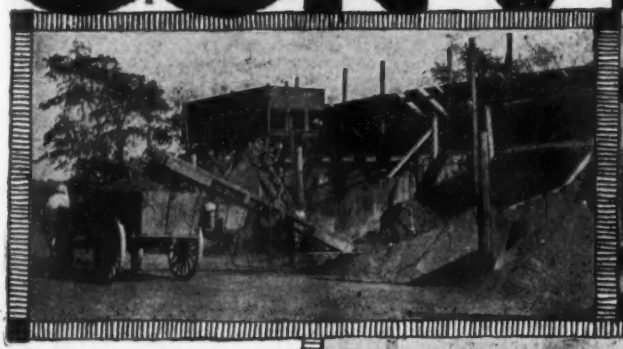
Southern Representative,
Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA

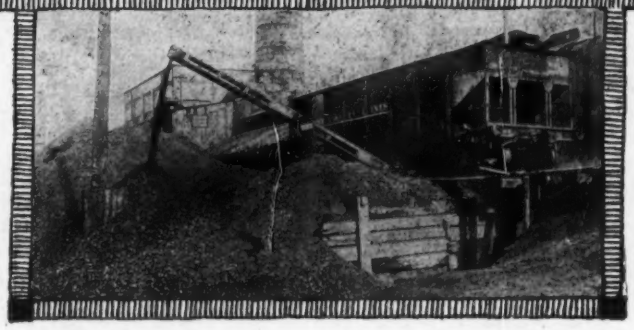
NEW YORK
SAN FRANCISCO



The SCOOP CONVEYOR



Loading coal into trucks with a Scoop Conveyor saves labor and permits of more deliveries per day. The feed end of the machine can be pushed or buried right into the coal pile, making it possible to simply scrape the coal onto the carrying belt instead of lifting it up by shovelfuls into the feeding hopper fitted to ordinary conveyors.



Unloading coal from hopper-bottom cars with a Scoop Conveyor saves the construction of a track hopper or pit. To unload a car the feed end of the machine is pushed under the hopper doors and the material is carried away by the belt as fast as it flows through. Cars can thus be unloaded quickly and with a minimum of labor at any point along the track.

THE Scoop Conveyor is an original, distinctive and serviceable labor-saving machine for storing, reclaiming and transferring material, for loading and unloading cars, trucks and wagons.

THE machines are made in different widths and lengths to suit different requirements. They are fitted with Electric Motor or Gasoline Engine according to conditions.

SAVES 6 to 12 MEN

and keeps equipment moving. Eliminates much shovel and wheelbarrow work. Enables men to work faster and easier. Does three to five days' work in one. Saves car demurrage.

OVER 2000 USERS

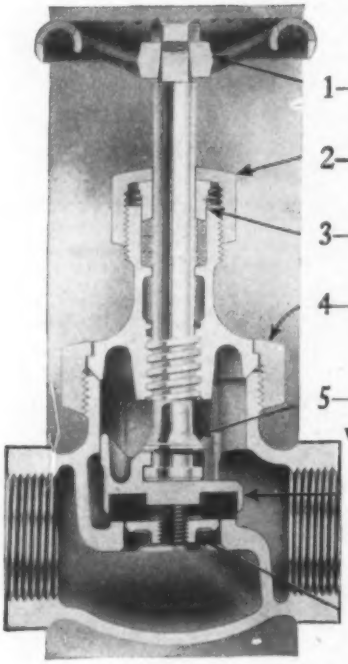
THAT the Scoop Conveyor has given satisfaction in every way and been a profitable investment to its owners is proven by the fact that about 50 per cent. of our sales are repeat orders.

WRITE FOR CATALOG NO. 56.

Portable Machinery Co., Passaic, N. J.

SEVEN FEATURES OF THE CRANE NUMBER 7

for use in plants where continuous service is required and where discs must be changed quickly without injury to the valve.



1—Easily removable malleable iron, non-heat wheel

2—Malleable iron nut

3—Brass gland

4—Malleable iron nut

5—May be packed under pressure when valve is wide open

6—Removable disc holder for quick change

7—Removable nut for changing disc

Made in sizes ¼-to 2-inch; for 150 pounds steam working pressure; discs for steam, air and water supplied as ordered. Body, Bonnet, Stem, Disc Holder, Gland, made of Brass.

Fully described in Circular No. 128 which will be sent upon request.

We are distributors of heating and plumbing materials.

SALES OFFICES, WAREHOUSES AND SHOWROOMS:

BOSTON, SPRINGFIELD, BRIDGEPORT, ROCHESTER, NEW YORK, ALBANY, BROOKLYN, PHILADELPHIA, NEWARK, CAMDEN, BALTIMORE, WASHINGTON, SYRACUSE, BUFFALO, SAVANNAH, ATLANTA, KNOXVILLE, BIRMINGHAM, MEMPHIS, LITTLE ROCK, MUSKOGEE, TULSA, OKLAHOMA CITY, WICHITA, ST. LOUIS, KANSAS CITY, TERRE HAUTE, CINCINNATI, INDIANAPOLIS, DETROIT, CHICAGO, ROCKFORD, OSHKOSH, GRAND RAPIDS, DAVENPORT, DES MOINES, OMAHA, SIOUX CITY, ST. PAUL, MINNEAPOLIS, DULUTH, FARGO, WATERTOWN, ABERDEEN, GREAT FALLS, BILLINGS, SPOKANE, SEATTLE, TACOMA, PORTLAND, POCATELLO, SALT LAKE CITY, OGDEN, SACRAMENTO, OAKLAND, SAN FRANCISCO, LOS ANGELES

FOUNDED BY R. T. CRANE, 1855

CRANE CO.

836 S. MICHIGAN AVE.

CHICAGO

WORKS: CHICAGO AND BRIDGEPORT

CRANE LIMITED — MONTREAL, TORONTO, VANCOUVER, WINNIPEG, LONDON, ENG., SYDNEY, N. S. W., QUEBEC, HALIFAX, OTTAWA, CALGARY.

Mercantile and Industrial Buildings of CONCRETE *Mean—*

Fireproof, permanent, practically maintenance-free structures.

Freedom from vibration, greater load carrying capacity and reserve strength.

Speed of construction, regardless of season.

Well lighted, clean, healthful surroundings—helping to make contented workers, who increase production.

First cost is practically the only cost.

Low insurance cost.

You'll be interested in our new booklet "Mercantile and Industrial Buildings of Concrete." Just ask our nearest District Office to send you a copy.

Reinforced Concrete Loft Building, Hoboken Land & Improvement Company, Hoboken, N. J.

PORTLAND CEMENT ASSOCIATION

Offices at

Atlanta				Salt Lake City
Chicago	Detroit		New York	San Francisco
Dallas	Helena	Los Angeles	Parkersburg	Seattle
Denver	Indianapolis	Milwaukee	Pittsburgh	St. Louis
Des Moines	Kansas City	Minneapolis	Portland, Ore.	Washington

Kaustine

Sanitary Sewage Disposal Systems

Better Morale in *Your* Mill Village

THE better class of workmen ***seek*** the ordinary conveniences and comforts of home life, which you ***demand*** for yourself. They know that their productive power and earning capacity are dependent upon their physical condition as well as upon their mental state.

Kaustine Sanitary Equipment installed in mill homes provides the comfort and refinement essential to healthy, contented inhabitants of unsewered mill villages.

It is complete and scientific in every respect—endorsed by health boards everywhere, because of the thorough and adequate manner in which it disposes of fecal matter immediately after discharge from the body. It affords the convenience of a city water toilet.

To insure an ample supply of reliable labor, every mill village in an unsewered area should be equipped with a Kaustine Chemical System, or Hydro Kaustine Septic Tanks. It is welfare work that returns big dividends.

Send for our catalog H, which shows how Kaustine equipment solves the problem of sanitation in unsewered areas, and provides the convenience that keeps men healthy and satisfied.

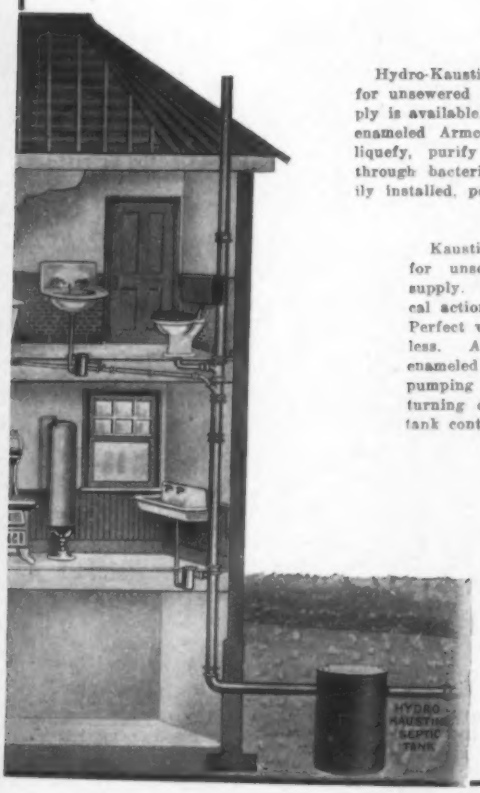
KAUSTINE COMPANY, Inc.

Manufacturers and Sanitation Engineers

Buffalo, N. Y. Toronto, Can. Melbourne, Aus.

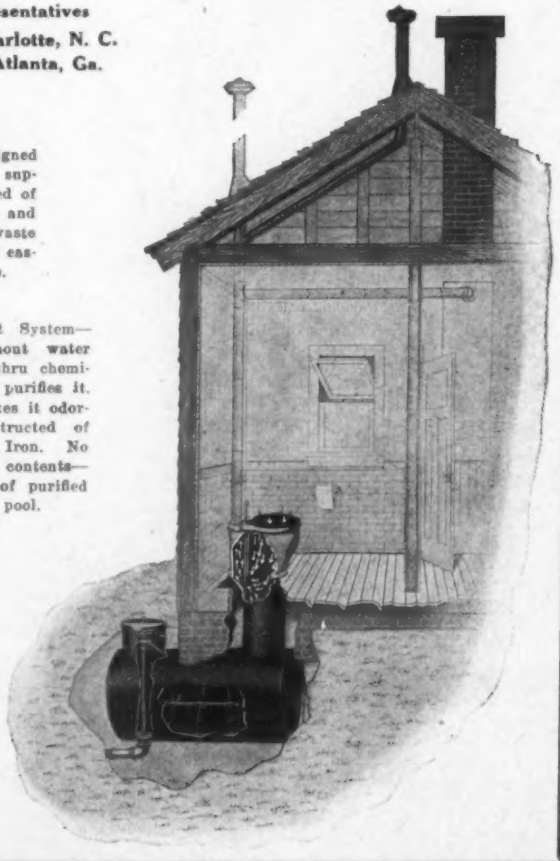
Southern Representatives

J. L. Murphy, Charlotte, N. C.
McKee & Son, Atlanta, Ga.



Hydro-Kaustine Septic Tanks—designed for unsewered sections where water supply is available. They are constructed of enameled Armco (the pure) Iron, and liquefy, purify and disperse all waste through bacterial action. Odorless, easily installed, permanently serviceable.

Kaustine (Chemical) Toilet System—for unsewered sections without water supply. Disposes of sewage thru chemical action which liquefies and purifies it. Perfect ventilation system makes it odorless. All metal parts constructed of enameled Armco (the pure) Iron. No pumping or dipping of tank contents—turning drain valve disposes of purified tank contents through leaching pool.



Aladdin

Manhasset Mfg. Co. Says "Better and Cheaper"

Approving the Aladdin System of Industrial Housing Construction.

Firms confronted by problems of Industrial Housing can find a valuable precedent in the experience of those firms who have housed their employees in Aladdin Homes.

We are well prepared to render to any firm the complete satisfaction which is evidenced in the letter of the Manhasset Manufacturing Company from which the following paragraphs are quoted.

"Our reason for building your houses was primarily the lack of housing facilities in Putnam, Conn., and we found we could put up a very nice house of your design very much cheaper than we could build through local contractors.

"These houses we have been buying from you are certainly of good material and make an excellent house for our help. I think we have now put up thirty-nine (39) of them in all, and are very much satisfied."

Aladdin——

—expedites your building project—
—houses your men well and quickly—
—saves 18% of the cost of lumber—
—saves 30% of the labor cost—
—reduces the skilled labor required—
—guarantees complete shipment of material—
—guarantees the quality—
—carries material for 1000 houses in stock—
—ships from the nearest timber region—

—quotes definite prices on any order from one house up to a city of 3000, including churches, schools, offices, water and sewage systems, electric plants, street and house lights, heating plants, street parks, trees, lawns, etc., complete.

Write, wire or phone for Aladdin catalog No. 1535

The Aladdin Co.

OFFICES AND MILLS AT
Bay City, Michigan
Wilmington, North Carolina
Hattiesburg, Mississippi
Portland, Oregon
Toronto, Ontario

Industrial Housing

The Attractive Mill Village

is an important factor in securing labor.

THE tendency of the times is toward beauty—and it is universal. Formerly it was characteristic of the wealthy. Now it has found its way into the homes of all classes. The attractiveness of the home, its surroundings and the village as a whole, will play an important part in your labor problems of the future.

The interest of the mill demands *lasting qualities* in the construction of homes for its operatives.

Human nature demands *convenience* of arrangement.

Comfort is the inherent right of every human being.

Strictest *economy* at a time of high costs is highly essential in all construction.

All These—Beauty, Durability, Convenience, Comfort, Economy

are the principal features of

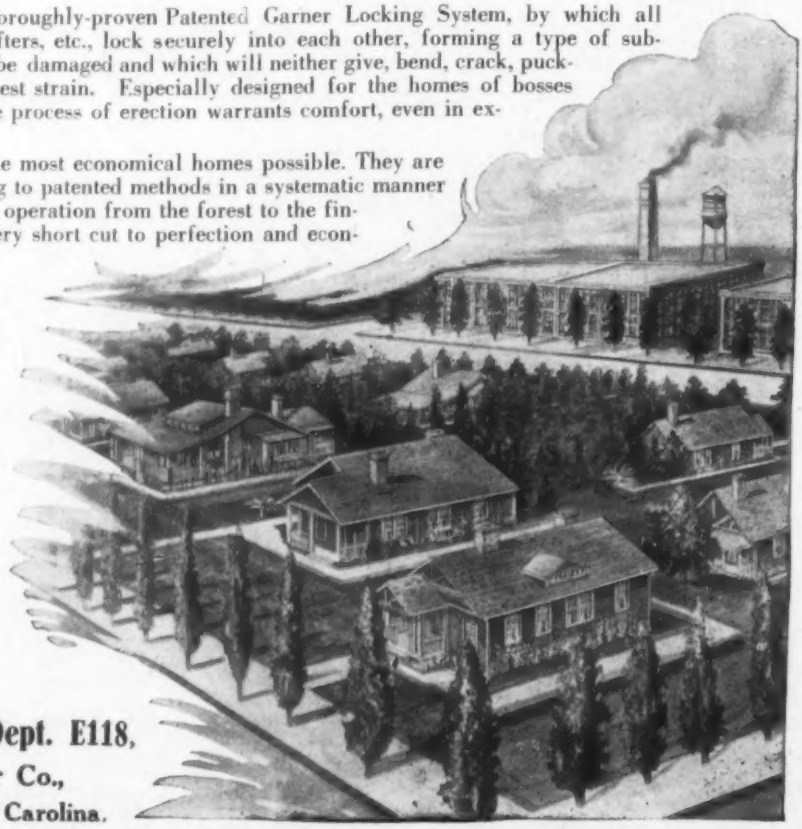
QUICKBILT BUNGALOWS

Snug, attractive, well-planned, artistic, roomy little bungalows especially designed for attractive, industrial villages.

Built after the practical, thoroughly-proven Patented Garner Locking System, by which all sleepers, joists, panels, plates, rafters, etc., lock securely into each other, forming a type of substantial home that cannot easly be damaged and which will neither give, bend, crack, pucker nor warp, even under the greatest strain. Especially designed for the homes of bosses or operatives. The doubly secure process of erection warrants comfort, even in extremes of hot or cold weather.

QUICKBILT Bungalows are the most economical homes possible. They are made in large quantities according to patented methods in a systematic manner by a plant which covers the entire operation from the forest to the finished house. As a result with every short cut to perfection and economy afforded the cost of manufacture is cut in half and all extra middle-men's profits and commissions are avoided. They are sold direct to you from the forest.

Arriving already built with nothing left but the erection, the labor usually necessary for construction is reduced to a minimum. There will be no piles of waste lumber left. Every waste in material, time, labor and money is avoided.



The Most Logical, Modern, Practical, Economical Method of Home Building.

For fuller explanation address

QUICKBILT Bungalow Dept. E118,
A. C. Tuxbury Lumber Co.,
Charleston, - - South Carolina.

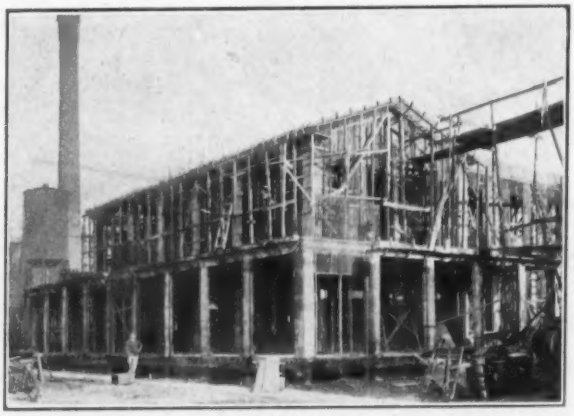
10-FAMILY APARTMENT HOUSE BUILT OF FORMLESS RE-INFORCED CONCRETE FOR AVONDALE MILLS

The Avondale Mills (Birmingham, Ala.) Again Show Their Faith in the *Permanence* and *Economy* of

ENSLEY BASIC SLAG

by using it in the three **reinforced concrete** structures shown on this page—a ten-family apartment house, a commodious Community House and a combination laundry and ice plant.

Other big cotton mills mindful of their employes' welfare have turned from frame to concrete construction for these real advantages—perfect sanitation, freedom from vermin and fire, freedom from repairs and replacements.



Excerpts from report of City Building Inspector

"Test on floor on 10-family simplex house for Avondale Mills, Birmingham:

"The floor test is 16′ x 14′ clear span, a 4″ finish slab with 26 gauge Hy-Rib reinforcement: 170 lbs. total dead and live load remained on floor 24 hours. The deflection at end of loading one slab was 3/64″ and the other 1/32″. Upon load being removed the floor moved up to its original position.

J. E. SPENCER,
City Bldg. Inspr.,
Birmingham, Ala.

Details of these substantial enlargements just completed for Avondale Mills will be mailed to interested executives.

Owners of Avondale Mills have in recent years used thousands of tons of **Ensley Basic Slag** in the construction of permanent buildings, houses, streets and roads at Birmingham, Sylacauga and other points.

Birmingham Slag Co., April 12, 1920.
Birmingham, Ala.

Gentlemen:

The enclosed report from City Building Inspector covers his test on a concrete slab in Apartment Job for Avondale Mills.

The mixture used was 1:2:4, the aggregate being Ensley Basic Slag. We give considerable credit for the splendid showing made to the use of the aggregate which has certainly proved beyond doubt its adaptability to our system of reinforced concrete construction without the use of forms. Yours very truly,

Donaldson Concrete Construction Co.

BIRMINGHAM SLAG COMPANY

Branch Sales Office
84 Marietta St.,
ATLANTA, GA.

Home Office: Jefferson County Bank Building
Birmingham, Alabama

Branch Sales Office
Williams Bldg.,
THOMASVILLE, GA.

Use Corrugated Bars To Save Steel--Time--Labor

CORRUGATED BARS save steel because their shape is such that the mechanical bond formed with the concrete is positive and certain throughout the entire length of the bar. The saving of steel is accomplished by designing with a definite factor of safety not possible when ordinary reinforcing material is used. No more steel need be used than that calculated to take care of tensile and compressive stresses.

Deliveries are facilitated by warehouse stocks located at strategic points. The use of Corrugated Bars shop fabricated saves time and much skilled labor on the job.

Our Engineering Department has had 30 years of experience in reinforced concrete design and construction.

Illustrated literature and bulletins on request.

DIVIDE the definite quantity of steel available for bars into an excessive number of sizes (as is now done) and you can never be sure of quick delivery on quantities of any particular size.

REDUCE the number of sizes and you increase the stock of every size.

WE RECOMMEND THE EXCLUSIVE USE OF THESE SIZES:

⅜″ Round ½″ Round ½″ Square ⅝″ Round
¾″ Round ⅞″ Round 1″ Round 1″ Square
1⅛″ Square 1¼″ Square

CORR-PRODUCTS

Corrugated Bars
Corr-Plate Floors
Corr-Mesh
Corr-Bar-Units
Corr-Column Spirals

Louis De Jonge Co., Clifton, N. Y.
Arch. and Eng'r., Valentine & Kissam, New York.
Contr., American Concrete Steel Co., Newark, N. J.

Corrugated Bar Company, Inc.

Mutual Life Bldg., Buffalo, N. Y.

DISTRICT SALES AND ENGINEERING OFFICES

New York Chicago Boston Philadelphia St. Louis Syracuse
Kansas City Houston Atlanta Milwaukee St. Paul Detroit

For engineers, architects, contractors, and students of reinforced concrete construction we offer a handbook of "Useful Data." Price $2.50.

Corrugated Bars

Steel Sash Made It Practical

A LARGE building! Measuring 145 feet wide by 170 feet long as it does, ordinary windows would never have given fresh air to the workers in the central bays.

High ceilings—14 feet;—sash 12 feet high, extending clear to the ceilings to admit all the light possible to a mill-construction building: these were the first steps toward getting full investment returns from the floor space.

But more was needed. Common single ventilators, placed midway of the height of the sash, do not ventilate a wide building on a windless day. Even with a breeze, the air above them is stale, and, as it cools, it descends and contaminates the fresher air below.

So this big cotton mill was given an upper set of ventilators, right against the ceiling. By opening them that mass of warm stale air is given free outlet; and, as it goes out, fresh air comes in. No wind is needed.

Lupton Steel Factory Sash made practical the economies of this wide building. Our catalogue No. 10-LSS tells all about it. Shall we send you a copy?

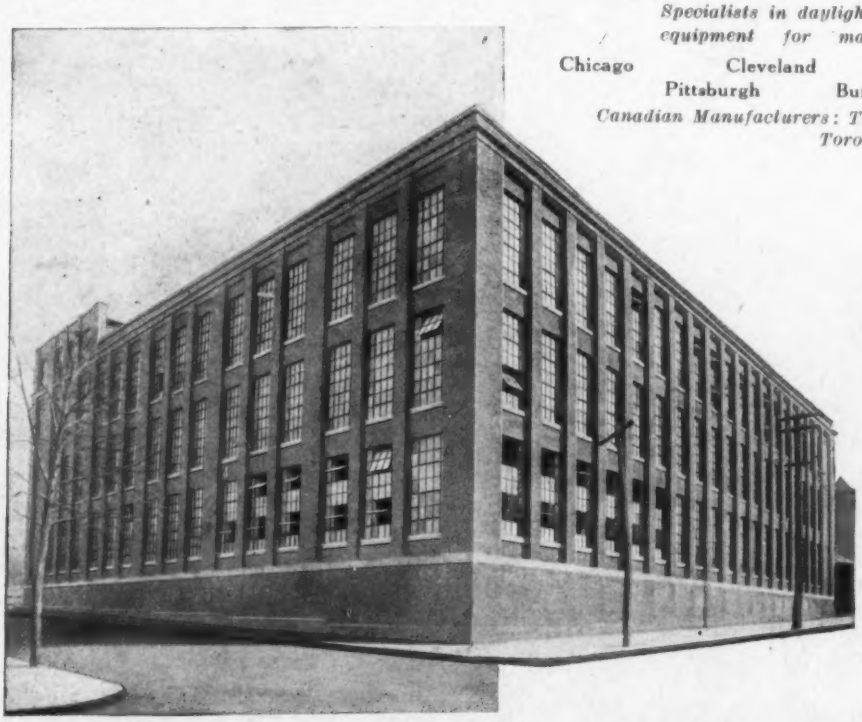
DAVID LUPTON'S SONS COMPANY

Amber St. and Allegheny Ave. Philadelphia

Specialists in daylighting and ventilating equipment for maximum production

Chicago Cleveland New York Boston
Pittsburgh Buffalo Detroit

Canadian Manufacturers: The A. B. Ormsby Co., Ltd. Toronto



Lupton
INVESTMENT VALUE

Lupton Pivoted Factory Sash—Cat. 10-LSS

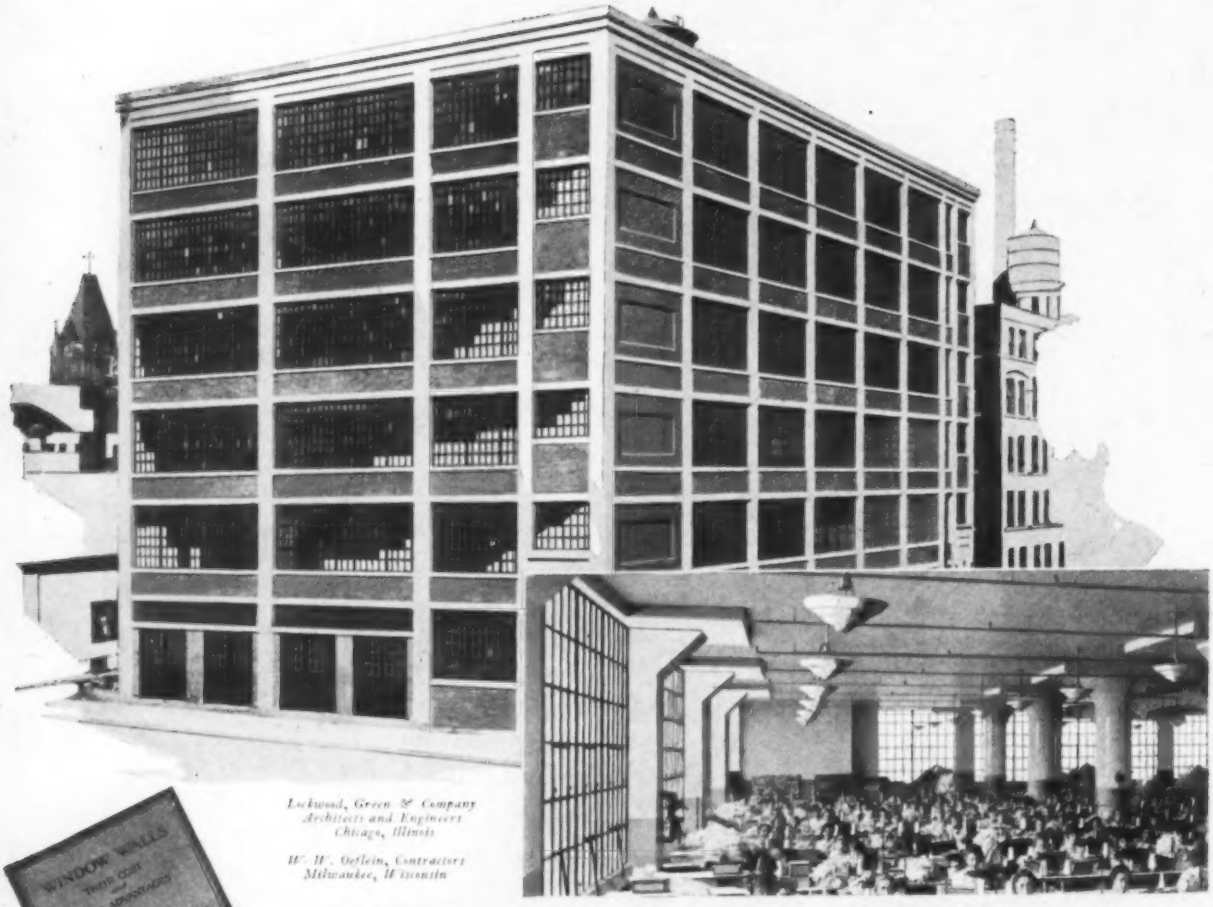
Lupton Counterbalanced Sash—Cat. 10-LCB

Lupton Steel Partitions and Doors—Cat. 10-LSP

Lupton Rolled Steel Skylight—Cat. 10-Misc.

Pond Continuous Sash, for Pond Truss roofs, monitors, saw-tooths, and side walls—Cat. 10-PCS

Pond Operating Device for long lines of sash—Cat. 10-PCS



Lockwood, Greene & Company
Architects and Engineers
Chicago, Illinois

W. H. Oeflein, Contractors
Milwaukee, Wisconsin

Write for this Book

We have published this book for your information. It gives facts and comparative cost figures in detail. It summarizes just what you want to know about Windows, Walls and WindoWalls. Drop us a letter today and we will mail it to you.

"The Walls are Windows

in our factory. The big idea is to make our building as pleasant a place as possible. Every facility has been provided to keep our workers healthy and happy," is the way the Holeproof Hosiery Company, Milwaukee, advertised for labor.

You, too, can secure a better class of labor and more efficient work if your factory is well lighted and ventilated with Fenestra Steel WindoWalls.

Brick and stone walls with wooden windows restrict light and ventilation and consequently such a building is usually dark and gloomy and not a healthful, pleasant place to work in. Walls of this type are expensive from the standpoint of efficient service.

Fenestra Steel WindoWalls of shining glass and Steel Bars flood your building with energy producing daylight.

Ventilation can be controlled at the location required. Each ventilator is controlled by Fenestra Cam Latch and Stay operator. Fenestra WindoWalls are the most economical of all wall materials; they make light cost less and produce more.

Detroit Steel Products Company, 3714 East Grand Boulevard, Detroit, Mich.

ABERTHAW
CONSTRUCTION COMPANY
ATLANTA PETERS BUILDING

The Great Falls Manufacturing Company, at Somersworth, New Hampshire, has decided to abandon the handicaps of early construction, and has devised a new plant, which, when complete, will be the greatest cotton mill in the world.

To ensure the adequate fulfilment of this vast project, the Company has chosen ABERTHAW *as its builder.*

The MAGIC *of* HARD WORK

ALADDIN rubbed his wonderful lamp and a palace sprang into being. But there is no magic about modern construction: it is a matter of hard work by brain and muscle.

¶ Nevertheless there are those who think that a building may be juggled into existence more cheaply at a blanket price, where individual items of actual cost are suppressed, than where they are defined as a basis for charges.

¶ Such thinking is as natural as covering one's head to avoid exact details of noises in the dark — and as foolish.

¶ ABERTHAW does no dealing in unknown quantities. It operates solely in terms of demonstrable facts. In substantiation of its policy it maintains a building organization second to none in speed, economy and accuracy of procedure.

¶ Back of this is an accounting system that relentlessly follows costs, not only for their accurate recording, but also for their use in measuring the relative efficiency of work in progress.

¶ Built by Magic could produce results no more complete or more precisely adjusted to the given need than *Built by Aberthaw.*

ABERTHAW CONSTRUCTION COMPANY
CONTRACTING ENGINEERS
BOSTON MASSACHUSETTS
ATLANTA PHILADELPHIA BUFFALO

6-98

SERVICE

Standardization of a product like textiles is likely to lead to stagnation in manufacturing equipment of the industry for the reason that the margins of profit are so reduced that very few mills believe they can afford to make extensive alterations or changes in plants already equipped and in fair condition with respect to competitive mills.

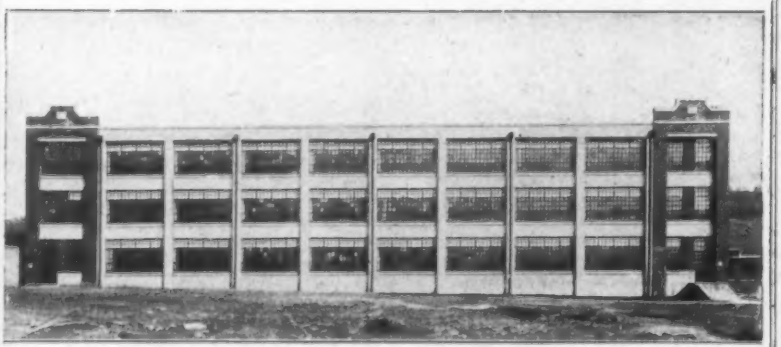
The keener visioned manufacturer does not share this attitude toward the outlay for changes of relative magnitude. He recognizes that new machinery, labor and power saving devices, direct electrical drive, better lighting, ventilating and air conditioning and other improvements will give him the key to increased production, lessened maintenance charges, lower overhead and greater profit.

But just as surely as these improvements are necessary, so too, do they require the services of a specially trained and experienced engineering organization to determine the proper changes and the warrantable expenditure in relation to the possible increase of output and to those other factors which can contribute to greater profits for the manufacturer.

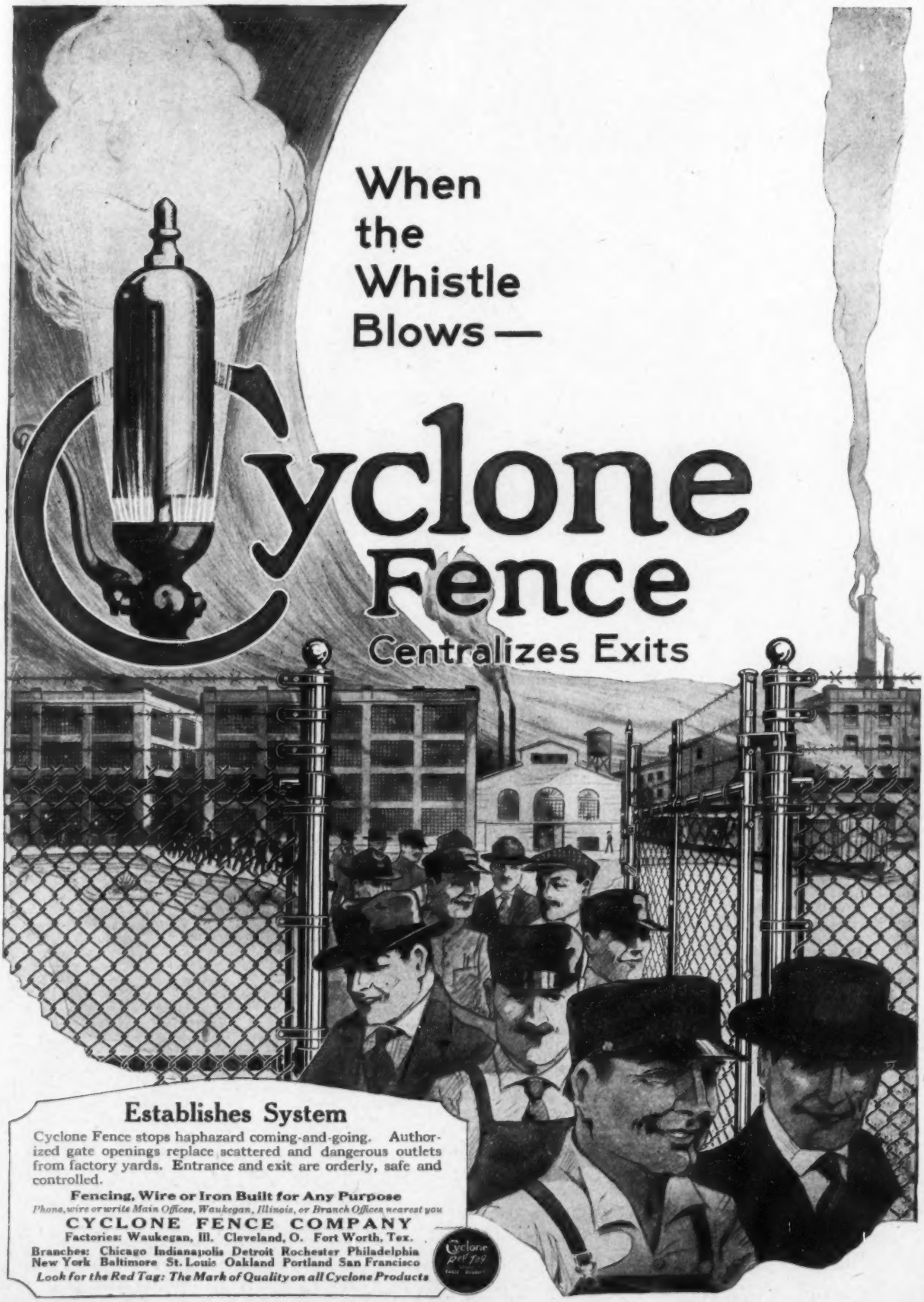
J. E. SIRRINE

Engineer and Mill Architect

Greenville South Carolina



Thatcher No. 1 Mill, Chattanooga, Tenn., designed and built under the supervision of J. E. Sirrine. No. 2 Mill and Warehouse, now being designed.



Establishes System

Cyclone Fence stops haphazard coming-and-going. Authorized gate openings replace scattered and dangerous outlets from factory yards. Entrance and exit are orderly, safe and controlled.

Fencing, Wire or Iron Built for Any Purpose

Phone, wire or write Main Offices, Waukegan, Illinois, or Branch Offices nearest you

CYCLONE FENCE COMPANY

Factories: Waukegan, Ill. Cleveland, O. Fort Worth, Tex.

Branches: Chicago Indianapolis Detroit Rochester Philadelphia New York Baltimore St. Louis Oakland Portland San Francisco

Look for the Red Tag: The Mark of Quality on all Cyclone Products

Co-operation-
a Building Factor

CO-OPERATION, the ability to work with an Owner as well as for him, is the outstanding characteristic of this organization, which is probably responsible for a large measure of the preference shown it.

Twenty-seven years ago a man conceived a type of building firm that should be different in policy and practice—The John W. Ferguson Company.

His idea was an organization which, while adapted for speed and economy, the twin essentials of modern building, should retain the honesty of purpose and quality of work that reaches beyond the letter of specification and is productive of the true co-operative spirit.

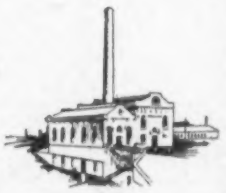
That concept, put into practice, has become Ferguson Service, and throughout more than a quarter century of industrial building, the only changes it has known have been such as tended toward a broader field, a closer, more complete co-operation with its clientele.

John W. Ferguson Co.

Engineers and Building Contractors

PATERSON, N. J. NEW YORK CITY

65-101

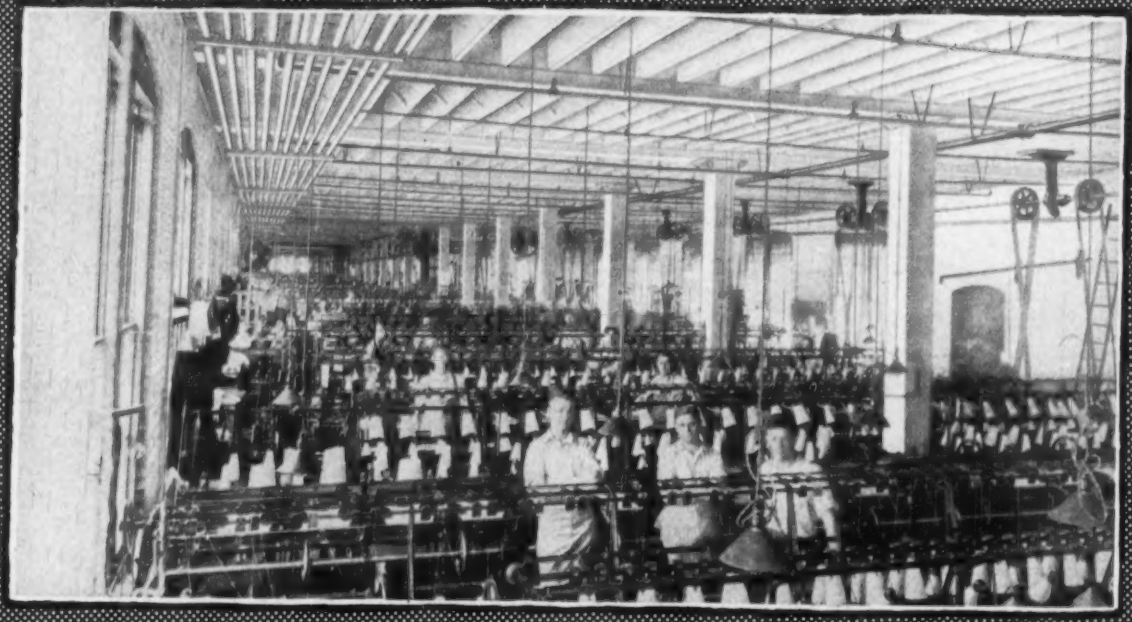


JOHN W. FERGUSON CO.

These firms know the worth of Ferguson Service:

Spencer Kellogg
Riegel Sack Co.
Follmer, Clogg & Co.
J. H. Williams & Co.
Klots Throwing Co.
— ask them —

Toco Mill White



No Wonder These Workers Are Happy

Even on dark, stormy days this factory is bright and cheerful. There isn't a dark, dingy place in the entire building—everything is clean and sanitary. Light is diffused and reflected into every corner by walls and ceilings painted with

Toco Mill White

Workers in factories of this kind are not looking for new positions. On the contrary, they bring new workers because of the pleasant surroundings.

Toco Mill White will make any factory bright and sanitary. It penetrates deep into the pores, waterproofing the surface and decorating it as well.

We Are Specialists

For many years we have been devoting our efforts to the manufacture of protective and decorative coatings for Industrial Plants—we are specialists in this particular line.

When you have any surfaces in your plant to decorate and protect we shall be very glad to give you our recommendations and quotations.

The Tropical Paint & Oil Co.

Cleveland, Ohio

Specialists in the Manufacture of Protective and Decorative Coatings for Industrial Plants.
Branch Offices in Principal Cities.

ANNOUNCEMENT

WE have just moved into our new plant, which is one of the largest and best equipped manufacturing plants in the South.

We standardize on our regular high grades, consisting of Mill White, Flat and Gloss, Ready Mixed House Paints, Varnishes, Cottage Paints, Barn Paints, Stains, Roof Paints and in fact a complete line. We are in a position to give you quality and service second to none.

We are a Southern Corporation and have a specialty man who studies only climatic conditions in the South, thereby being able to give you a Paint suitable for any purpose, which will stand all climatic conditions. It wears well, if not better than any Paint you can buy elsewhere.

We use only the best grades of raw material in making our Paints and guarantee the quality of every gallon we make.

Send us your specifications and write for further particulars. Address Department P.

Johnson Paint Company

P. O. South Atlanta, Georgia

The Economic Upkeep of Your Mill

demands your closest attention. You could not replace your buildings at near their former cost, therefore it is good business to protect your property against decay. For every surface that needs a protecting coat of paint, you'll find a *Pee Gee* Product that will give you longest service at lowest cost.

Pee Gee Industrial Paints

that will reduce the cost of upkeep

Pee Gee COTTAGE PAINT
For House Exteriors.

Pee Gee FACTRILITE
Mill White for Interior Walls and Ceilings.

Pee Gee SHINGLE STAIN
For Shingle Roofs and Weather Boarding.

Pee Gee PATCH-IT-ALL
Renews Old Roofs, Stops Leaks.

Pee Gee FIROFEND
Fire Retardant Paint for Shingles.

Pee Gee UTILITY RED OXIDE
For Warehouses and Outbuildings.

Pee Gee INDUROCK
Makes Cement Hard as Rock.

Pee Gee VEL-KOATT
For House Interiors

Pee Gee ANTI-CORROSIVE
Black Roof Paint; for Composition, Slate and Metal Roofs.

Pee Gee LIG-VIT-OL
A penetrating Wood Preservative.

Pee Gee FERRONITE
Rust Inhibitive Metal Paint.

Pee Gee GRAPHITE PAINT
For Smoke Stacks. Boiler Fronts, Metal Surfaces.

Pee Gee DREDNAUGHT BLACK
For Metal Surfaces

Our Service Department at Your Dispsoal

Suggestions, advice and even the services of an experienced man to supervise the jo[b] asking, no obligation whatsoever, just a demonstration of the Pee Gee ides of thoro[ughness]

Write for booklet on "Pee Gee Industrial P[aints]"

are yours for the ghness and efficiency

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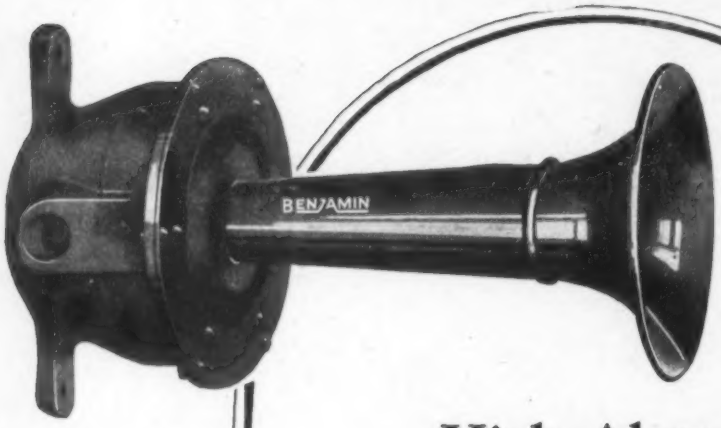
Paint Grinders—Varnish Maker

Established 1867

Co.

Louisville, K



BENJAMIN PRODUCTS

High Above The Confusing Roar of Machinery

BENJAMIN Industrial Signals sound the call, that blasts through the whir of machinery and the flapping of belts, to warn workmen of impending danger or to call an executive from the factory to an important conference.

Benjamin Industrial Signals installed in various parts of your plant will serve a myriad of purposes. They will start your working day and bring your men back from their lunch on time. They give fire alarms, burglar alarms and police signals. Particularly in places where a gong or a bell fails to be heard above the din of machinery, Benjamin Industrial Signals prove their value.

For indoors and out, large and small factories, there is a Benjamin Industrial Signal to fit every need. Costs less to install than a good bell, and the cost of upkeep is nominal. Further facts gladly furnished upon request.

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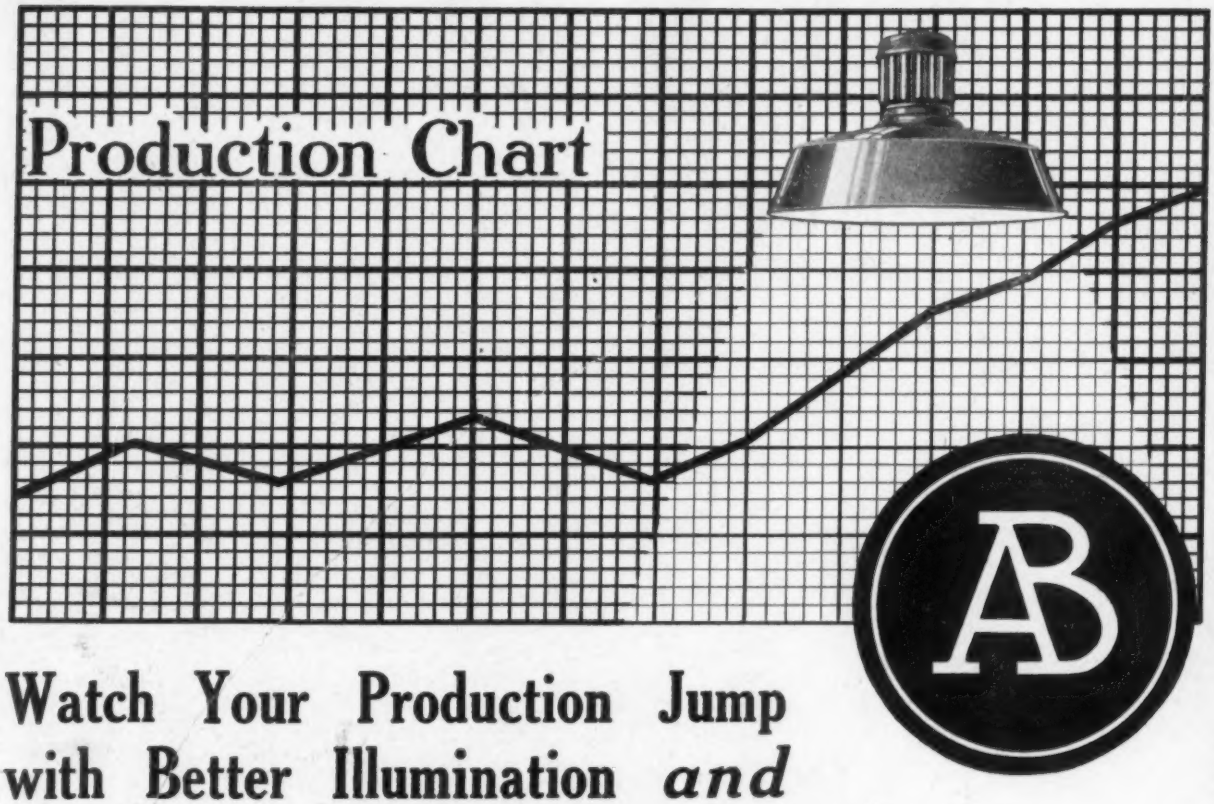
BENJAMIN
Makers of Things More Useful



Watch Your Production Jump with Better Illumination *and*

ABolites

Increased production is the most vital problem confronting plant owners today—increased production not with plant addition, but with the same equipment. It has been proven to the satisfaction of many plant managers that proper illumination will increase production. It will do the same for you.

Proper illumination means—ABolites—Porcelain Enameled Steel Reflector Equipment—properly designed and properly installed.

ABolites are made strong, coated with a superior enamel and of characteristics to meet your particular need. Our catalog or representative will give you additional information.

Four types of reflectors — RLM, Shallow Dome, Deep Bowl and Angle Bowl—furnished interchangeable with three types of holders and three additional types of one-piece neck construction — for Industrial Plants, Sign Illumination, Show Windows, Roadways, Yardways, Garages, etc.

Gyro Fans
Small Motors

ADAMS-BAGNALL ELECTRIC CO.
CLEVELAND
Chicago - - - - - 1511 Heyworth Bldg.

ADAMS-BAGNALL

"What's the joke"?

"It's no joke, chief, but you too will smile when I show you some figures—Now look,

"Last month I removed four 25-watt lamps costing.....$1.60
and installed one 100-watt Westinghouse Mazda C Lamp. 1.10

Saving $0.50

"Now then, I'm also saving,
75% on cleaning expense
75% on Lamp renewal costs
75% on sockets and wiring

"And greatest of all no MISSING lamps this past month.

"Missing? Missing? Call a spade a spade. You mean Sam that there has been no THEFT of lamps."

"Yes sir; and if you will multiply these figures by the number of outlets, we're saving,—"

"Yes, yes, I understand, but who first told you about this?

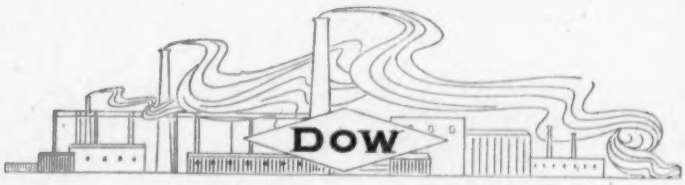
"Why the

Westinghouse Lamp Company
165 Broadway, New York, N. Y.
Sales Offices and Warehouses Throughout the Country.
For Canada:
Canadian Westinghouse Co., Ltd., Hamilton, Ont.

WESTINGHOUSE MAZDA LAMPS

DOW

MIDLAND BLUE R



Brighter in shade and faster to light, washing and bleaching than Indigo

Has greater ability to penetrate the fibre

Suitable for dyeing raw stock

An Indigo derivative destined to replace Indigo to a large extent

For sale by

ANILINE DYES and CHEMICALS, Inc.

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The Dow Chemical Company
MIDLAND-MICHIGAN Σ NEW YORK CITY
U - S - A

Need Lighting? Ask IVANHOE!

Most factory executives take a common-sense view of lighting. They have proved to their satisfaction that good lighting has a direct relationship to both the amount and the quality of output. They realize, therefore, their need of consultation with a man who understands lighting as a factor in production and not merely as a problem in wires, sockets, and lamps. Just as IVANHOE has gained a leadership in the manufacture of scientific shades and reflectors, so IVANHOE'S practical experts have achieved a high place in the application of good lighting to the increase of production, the decrease of spoilage and the reduction of accident hazards.

When may we have someone call to discuss this problem in your plant?

IVANHOE-REGENT WORKS of General Electric Co.
Cleveland, Ohio

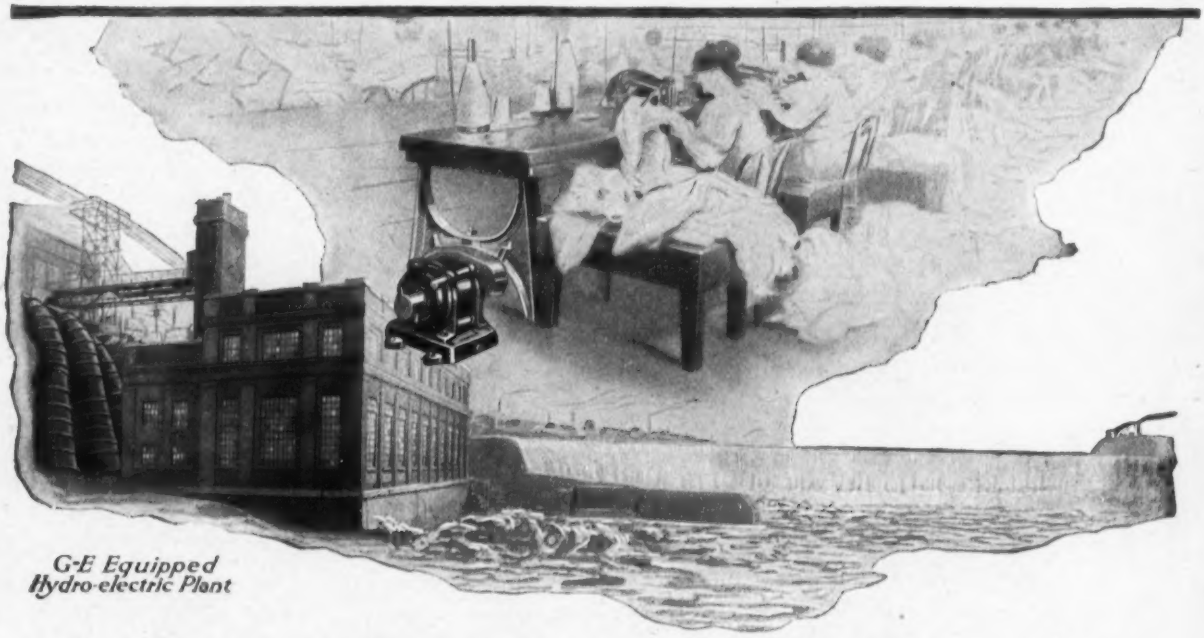
"Ivanhoe" Steel Reflectors, Lighting Glassware, Anderson Self-Adjusting Arms, and Illuminating Service.

"Service to Lamps"

IVANHOE

SHADES-REFLECTORS

In many cities production can be increased, its quality improved, and new industries added by efficiently making and using the available power



G-E Equipped Hydro-electric Plant

How electricity increased and improved a textile city's production

EACH mill in a certain textile city was driven by its old water-wheel—production was low, so was quality.

In summer, low water and leaky canal beds slowed up the wheels—in winter, anchor ice did the same.

Finally, G-E textile mill specialists were called in to suggest a better way of using the water power.

A central water power plant was built to supply all mills with electric power and provide a surplus for new industries.

Electric drives at each mill applied power directly to productive machines, and losses due to mechanical drives were largely eliminated.

Machinery was enabled to operate at a constant maximum productive speed.

Its output was increased 35% and a very much better product resulted.

Any community's efficiency may be increased manifold by the proper utilization of Nature's resources and the application of electricity in homes, industries or on farms.

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y.

MILL POWER DEPARTMENT, BOSTON, MASS.

Look for this mark of leadership in electrical development and manufacture

G-E motors

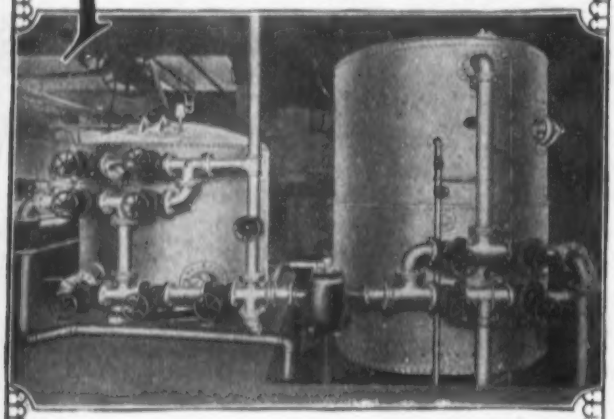
From the Mightiest to the Tiniest 44-98

GENERAL ELECTRIC COMPANY

Permutit

TRADE MARK

Water Rectification Systems



Make The Water You Use, Right—First of All

You know that water enters into every one of your processes—is a fundamental necessity. You know that the character of that water affects every process in which it is used. Isn't it—then—the most obvious, most logical thing, to make the water right, first of all?

"*Permutit*" will do it—absolutely, unfailingly, economically. "*Permutit*" has done it—is doing it—in leading textile plants the country over. And it has been the experience of these plants that "*Permutit*" savings and "*Permutit*" gains so far exceed the operating and maintenance costs of the "*Permutit*" plant, that the investment is a highly profitable one.

We are ready with conclusive proofs of "Permutit" dividends in textile plants. Shall one of our representatives call?

THE PERMUTIT COMPANY

440 Fourth Avenue NEW YORK

Offices in all Principal Cities

WATER SOFTENERS FILTERS

373

An Understatement

Fibre re-enforced Shambow Shuttles will increase yardage of automatic looms 1%. The percentage of increase of plain looms will be more than the increase for automatic looms.

April 24, 1920
SHAMBOW SHUTTLE CO
WOONSOCKET, R. I.

Card Cylinder Brush

FELCO

Cylinder Brushes

are made of superior quality materials by superior workmen with the result that they stand the use and abuse of long and severe service.

We have a department devoted to the repairing and refilling of brushes, and the same expert knowledge and workmanship used in the manufacture of FELTON BRUSHES goes into such repair work. We can serve you promptly and efficiently.

There is a FELTON Brush for every use at the lowest price consistent with the high standard of quality.

Comber Cylinder Brush

Write for prices on any new brush you desire, or brush repair work

D. D. Felton Brush Co., Atlanta, Ga.

S. A. Felton & Sons Co., Manchester, N. H.

Manufacturers and Repairers of all Kinds of Brushes.

COTTON

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L. L. ARNOLD, Editor. R. W. PHILIP, Associate Editor.

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Orders for any change in advertising must reach Atlanta previous to the tenth of the month preceding month of issue, otherwise publishers cannot be responsible for changes.

When changing address, notify us, not the postmaster. Always give the old address as well as the new one.

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They're as Clean as a Whistle"

DIXON'S
PIONEER
BOILER
GRAPHITE

"Dixon's Boiler Graphite is what does the trick. By feeding it to the boilers old scale is softened and broken down so it can be cleaned out, and new scale is largely prevented from forming.

"The action of graphite is purely mechanical, so it never does any injury to the boilers or the fittings on the steam line."

Dixon's Pioner Boiler Graphite is the one safe and sure scale remedy that you can use with absolute confidence. "Graphite for the Boiler" is a booklet that tells all about it.

Write for Booklet No. 34-T.

Made in Jersey City, N. J. by the

Jos. Dixon Crucible Co.

Established 1827

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- Cup Grease
- Joint Compound
- Silica-Graphite Paint
- Waterproof Grease
- Flake Graphite
- Motor Brushes
- Solid Belt Dressing
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Weave Better and Wear Better

The smooth finish of our loom harnesses causes them to weave well because the friction of the warp is reduced to a minimum, and the softness and pliability of the finish make them wear well because the harness is tough and elastic and not brittle.

G
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SACO, MAINE

With the Publishers

In the Far East.

It is with a distinct sense of achievement that we present this month one more phase of the cotton textile industry in China. Absolutely authentic information prepared by a man familiar with conditions on both sides of the Pacific is difficult to obtain. Our Editors have been indeed fortunate in securing the interest and cooperation of Mr. Ben Y. Lee in the preparation of these articles.

Mr. Lee was in the United States for an extended period during which he attended the Philadelphia Textile School and the University of Pennsylvania. Returning to China he was engaged by the Hon. Chang Chien as instructor in carding, spinning and economics at the Nan Tung Textile College at Nan Tungchow. After about two years of this work, he was induced to enter the commercial field, becoming connected with the Textile Department of the Andersen, Meyer & Co., Ltd., of Shanghai in the latter part of 1919.

BEN Y. LEE.

A Little Matter of History

We have no especial desire to enroll our Editors upon the lists of discoverers, but as it is really a part of their work to discover practical and entertaining writers and introduce them to the textile men of America, it may not be inappropriate at this time to call attention to the fact that William Davis, M. A., a frequent contributor to COTTON'S Knitting Section and now quite popular with the textile press of this country, began his first series of articles in COTTON in the April, 1911, number. During the past nine years Mr. Davis has prepared articles for us on many subjects related to the knitting industry, some of which called for special research work. Photomicrographs showing the characteristics of knitting yarns and knitted fabrics, as well as special charts showing the effect of twist on knitting yarns were among the other features.

In early life Mr. Davis served an apprenticeship of six years in the pattern weaving department of a well known English firm, at the same time taking courses in textile classes. He passed through the various stages of examinations for the City and Guild of London, and holds elementary, advanced and honor certificates in woolen and worsted weaving and designing, and also in knitted fabrics.

WILLIAM DAVIS, M. A.

In 1902 Mr. Davis was, as the best student in the Hawick Technical School, awarded a traveling scholarship and for the next two years studied in a technical weaving college, at Reichenberg, Germany, of which he holds a diploma. He then took up the work of commercial and technical teacher, and has taught French and German classes under Galashiels school board; weaving and designing under Alva, Tillicoultry and Hawick school boards. He matriculated at the University of Edinburgh in 1904 and three years later graduated from that institution with a Master of Arts degree. In the year in which he entered the university he gained the silver medal for being first in Great Britain in the examinations in framework knitting and hosiery manufacture.

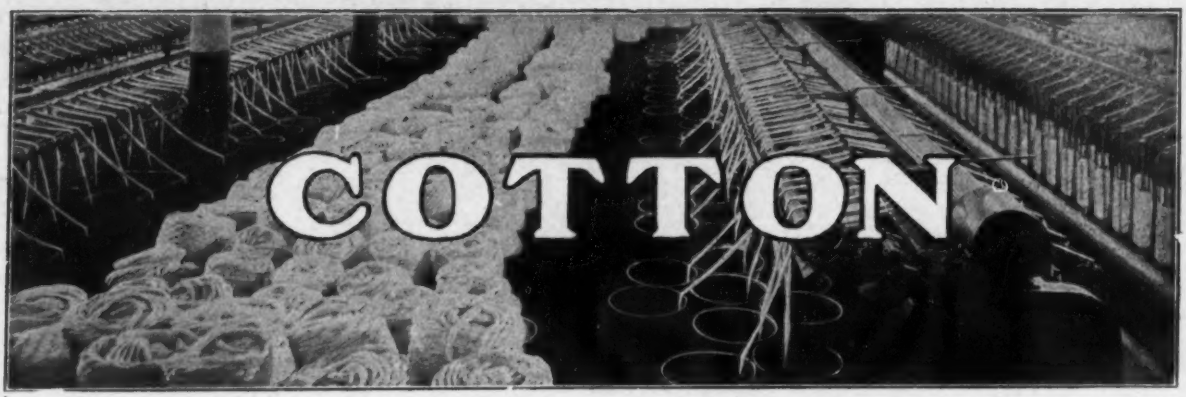
He was appointed to his present position of principal of the Hawick Technical Institute in 1909, where he lectures on the technology of the weaving and knitting industries. Several years ago he established classes in Hawick for the repairing of imperfections in textile materials. So successful have been these operations that classes in this subject have been established in Galashiels and Selkirk. Mr. Davis has published a "Textbook of Hosiery Manufacture" and another on the "Technology of Weaving."

AMONG COTTON'S READERS

Capt. Ellison A. Smyth
President and Treasurer Pelzer Mfg. Co., Pelzer, S. C.
President Belton (S. C.) Mills

"I am a regular reader of COTTON each month, and consider it a most interesting and valuable publication, and one that is a credit to our Southland. It is not only interesting from the cotton manufacturing standpoint, but is most valuable in giving a general survey of Southern business conditions.

Ellison A. Smyth



May, Nineteen-Twenty

Textile Manufacturing in the Far East.

For some months past COTTON has been emphasizing the rapid growth in the textile manufacturing industries of China, including the tendency toward technical instruction and more scientific efforts. It has pointed to the increasing number of modern mills equipped with up-to-the-minute American and English machinery. In this issue it is presenting two articles on community service work among some of these mills. Up to the present time it is the only textile publication that has devoted the necessary effort and space to depicting this great expansion in the Far Eastern textile field and deducing the probable effects on Chinese textile imports.

In August, 1912, COTTON said editorially:

> "The white races seem almost too secure in their commercial supremacy and it is no fiction to predict that the time may come, and more quickly than we now think, when the Mongolian, with his marvelous powers of imitation, may even equal the Caucasian despite the much vaunted initiative of the latter. In no one item is this fact more noticeable at the present time than in the comparative growth of the cotton manufacturing business in Japan. * * *
>
> " * * * Students of political economy declare that the first step toward commercial importance and final commercial supremacy is indicated by a recognition of the needs of the employee, and if this is true Japan is already a long way on the road toward the much desired goal, and a probable competitor in the textile manufacturing field."

After eight years of growth along the lines indicated, we find national legislators and others discussing methods of reducing Japanese competition in our own country, while in certain sections of the Far East, textiles exported from Japan have practically driven other foreign textiles from the field.

China should not be included in the same class just now, because the wide expanse of Chinese territory yet to be exploited and the millions of Chinese people calling for more and more low grade textiles, present a problem so vast as to make the present expansion of merely nominal importance so far as Chinese imports are concerned. Chinese exports of textiles may be considered as one of the events of the comparatively distant future. However, it is well to remember "the first step toward commercial importance and final commercial supremacy is indicated by a recognition of the needs of the employee." The movement recorded by the articles in this number of COTTON is only a small beginning—but it is a beginning.

Are the Railroads Liable?

A new phase in the alleged cotton fraud involving the Savage Cotton Company of Talladega, Ala., developed recently in the United States District Court when suit was filed by Texas cotton brokers against the A. B. & A. Railroad. These brokers claim to have suffered a loss of over $9,000 because of discrepancies between bills of lading and actual amounts of cotton shipped over this road by the Savage Company.

It was alleged that this firm of brokers bought from the Savage Cotton Company lots of cotton represented as weighing 149,025 pounds, and so shown on the bills of lading of the A. B. & A. Railroad, when, in fact, the cotton weighed but 122,839 pounds. The Texas brokers, it was stated, were forced to deliver to their customers the full 149,025 pounds, thus losing $9,326.54 in the transaction.

The suit sets out that the railroad became responsible for the shortage by receipting for and issuing bills of lading and asks judgment for the amount of loss and 7 per cent interest from March 26, 1918. The case is set for hearing in Atlanta on October 1.

This should prove of interest to textile mill managers from still another standpoint—that of coal. Coal delivered at the mill hardly ever equals the invoiced weight. This weight is usually known as the "mine weight," although a complaint for shortage in some instances brings the information that it is up to the bonded weigher of the receiving railroad, who weighs the coal for the mines. Very frequently by the time such coal reaches the scales it is dripping wet from being rained upon, and unless suitable allowance is made for this water by the weigher, the purchaser not only pays the coal rate for this water, but also pays a freight rate of approximately $5.00 a ton for hauling it to his mill. Under present conditions he has these charges to pay, although the water, if not already evaporated, causes a distinct loss in the coal burning efficiency.

It is also said to be a not uncommon occurrence for some trainmen to "drop off" a few lumps at points convenient to their own or their friends' homes. While these alleged acts are not condoned by the railroad officials, such actions are often "winked at" and never reported.

If it should be found that a railroad is responsible for the actual delivery of the weights called for in the bills of lading it issues, it is probable that more strict supervisory attention may be given such matters.

Don't Block the Traffic.

In the United States there are about 2,452,000 freight cars now in use. These are rolling in trains loaded and empty only 9.03 per cent of the time. They average 11.29 per cent time loading and 11.29 per cent being unloaded, if every car is released before demurrage starts. The balance of 68.39 per cent is waste time, due to repairs, switching, and unnecessary delays.

One hour saved each day for each car would equal 2,452,000 car-hours per day. Dividing this figure by 24 (hours per day) it is self-evident that the public would have over 102,000 additional cars to use through this simple saving of one hour per car per day. This would relieve business of a large proportion of the present car shortage, and directly speed up production for the entire country in a very effective way.

If every manufacturer will look into the conditions surrounding the car handling situation at his plant and see that the proper instructions are issued and obeyed, it will do much toward keeping the cars in motion on the railroads. A stationary car moves no goods. Every car-hour saved benefits the public.

The Meter-Liter-Gram Faddist.

Do you wish to adopt the meter-liter-gram fad at your mill?

Are you dissatisfied with the yard, the gallon, and the pound as units of measure?

Are you content to have Congress enact a law "providing for the compulsory introduction of the metric system" in the United States?

How would you like to have Congress enact a law providing for the compulsory introduction and enforced use of the Russian language in your country?

There is just as much sense, just as much justice, and just as much reason in the latter suggestion as in the former. Listen—

The people of this country as a class do not like to throw money into the waste paper basket. They may spend it unwisely, but when it comes to actually throwing it away—as a rule they don't.

The moving spirits behind the "meter-liter-gram" movement have capitalized the psychology of this thrifty impulse to further their own ends. They sent out quantities of printed literature expounding the wonderful advantages of the metric system, but remaining discreetely silent on its disadvantages. Accompanying this literature were stamped post cards addressed to Woodrow Wilson, Lloyd George and sometimes the Bureau of Standards at Washington. The back of the card was prepared to be scratched in favor of or against the metric system and a blank space left for the name and address of the individual signing.

In the United States, postage stamps represent money. They are not often thrown away. Moreover, a subtle feeling of personal importance stole over many a person as he or she came to the gratifying conclusion that these men at the head of governments might be influenced to some extent by the post card request. Then came the question of a decision for or against the meter-liter-gram. The average person knows little about the proposition except what was contained in the printed matter accompanying the card, and as the average American is usually willing to boost the "other fellow's game" if it can be done at no personal expense, the answer was a vast quantity of cards favorable to the metric system.

These are being exhibited to Congress with demands for action. A few active faddists backed by quantities of post card ballots.

If you don't want the metric system in your mill now is the time to say so, and say it to your senator and congressman so emphatically that there will be no question as to where *you* stand in the matter.

A New Type Testing Laboratory.

A new type of testing laboratory, which has the humidity conditions under automatic control, has been recently completed at the Bradford-Durfee Textile School, at Fall River, Mass. Unlike many other automatic humidity controlling apparatus, which work on the basis of percentage of humidity the room contains, the control used in this new laboratory is based on the percentage of regain that takes place in cotton when exposed to air containing varying amounts of moisture. It is said that this school is the only one in the country to have a testing laboratory controlled in this manner, although this new type is used in a few mills.

The yarn or cloth, whichever is used, is placed on a spreader, suspended from one end of the beam of the scale. This yarn or cloth weighs 1,000 grs. in a bone dry condition. Weights are provided for the other end of the beam which will balance the beam at the varying percentages of regain which take place in the cloth as the air in the room is moistened.

This action depresses the end of the beam and pushes two wire points into a cup of mercury, which completes an electrical circuit and throws into operation two humidifying heads. When the air in the room becomes sufficiently moist to cause the yarn or cloth on the spreader to take up the percentage of moisture desired, this additional weight of the yarn or cloth will raise the wire points from the cup of mercury, break off the electrical current and shut off the humidifying heads.

The value of humidity control in a testing laboratory may be readily appreciated when it is understood that a cloth tested for strength on a day when the atmospheric conditions are dry may show a result varying by as much as 18 per cent from the results obtained by testing the same cloth on a day when there is considerable humidity. Likewise the results will be different when the same piece of cloth is tested in a great humidity and then tested on a dry day. Consequently tests made on yarn or cloth in which the amount of moisture in the air is not considered can have very little scientific value. However, when tests are made under similar atmospheric conditions, no matter how much time intervenes, the results will be scientifically comparable. Many mills are coming to realize these facts and are consequently installing testing laboratories properly constructed.

The Bradford-Durfee laboratory is fully equipped with the necessary apparatus for making cotton, yarn and cloth tests. The equipment includes a conditioning oven that is used when determining the amount of moisture in cotton, yarn or cloth. With this apparatus, the sample being tested is weighed while being dried out without removing the sample from the oven. This is a very important point especially when determining the bone dry weight.

Remote Control for Bale Breaker Rooms

BY FRED L. BRYANT.*

In the picker rooms of cotton mills it is desirable to have control of the amount of cotton supplied from bale breaker rooms. Such control can be obtained by signal, by mechanical linkage or by electrical connection.

The disadvantage of the signal system is that it does not eliminate the human element and is neither dependable nor accurate.

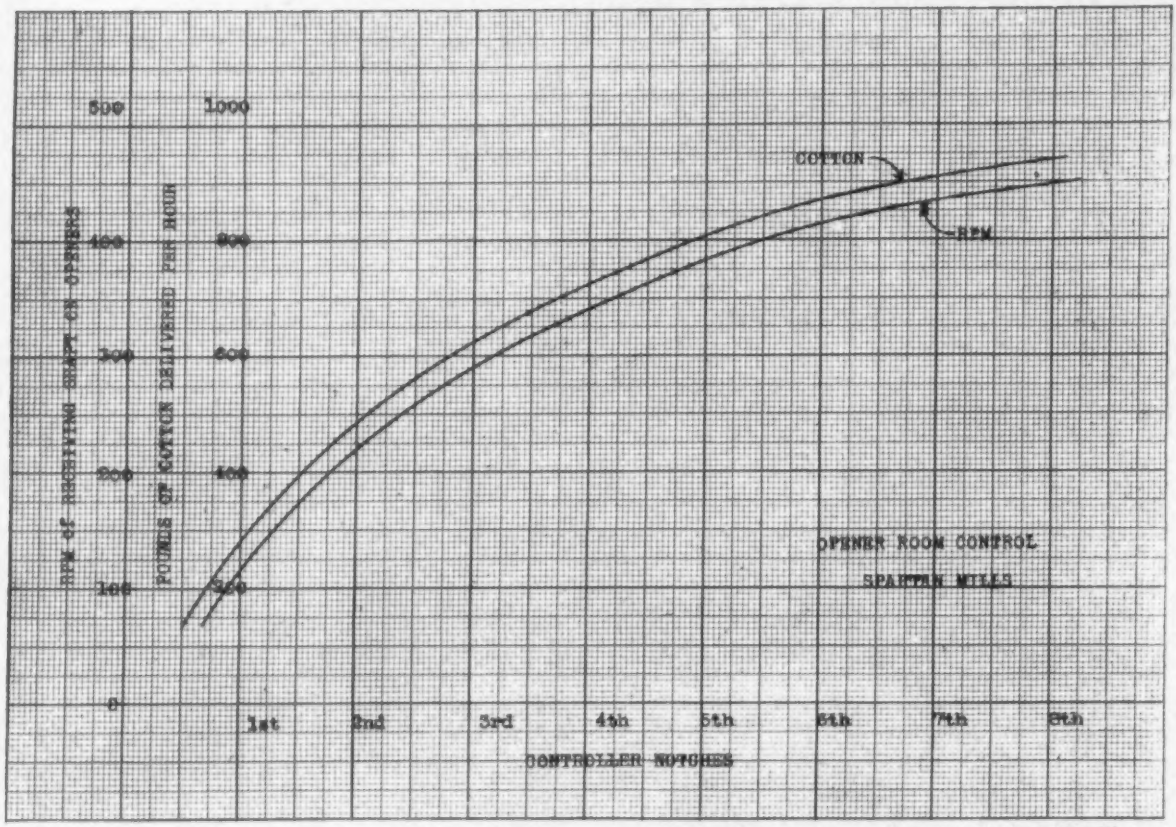
The mechanical system is quite satisfactory when the distance between the bale breaker room and the picker room is not too great. Such a system was first designed and installed at the American Spinning Company, Greenville, S. C., by T. A. Sizemore, superintendent and D. C. Leonard, master mechanic. It consisted of a continuous flexible steel cable ⅛-inch in diameter wound on a 4-inch diameter steel drum in the picker room and running through walls and floors on small sheaves to a similar drum in the bale breaker room about 150 feet away. When the drum in the picker room is turned the drum in the bale breaker room turns correspondingly. Through a chain from a sprocket on the drum to a sprocket on a shift lever, changes are made in the speed ratio on a Reeves variable speed transmission located between the motor and the counter shaft driving the bale breakers. Fourteen turns of cable are wound on each drum and the cable is held fast to the drum in the middle of the winding by a machine screw. Full control gives 176 inches of cable movement. A graduated register is connected to the drum in the picker room, indicating the position of the cable and consequently the amount of cotton going into the feeders. Cotton goes from the bale breakers in the breaker room through a condenser to a Morton distributor and is then dropped into hoppers of four automatic feeders. The total variation obtained by this method is from 132 r. p. m. minimum speed of receiving shaft on the bale breakers when about 350 lbs. of cotton per hour is handled, to 410 r.p.m. when about 1,000 lbs. per hour, the maximum amount of cotton handled in the picker room is produced. This is a reduction in cotton handled of 65 percent of maximum.

The electrical system has all the advantages of the mechanical system, together with the ability to operate at any distance. Such a control was installed at the Spartan Mills, Spartanburg, S. C., in August, 1919. It was originated by W. J. Britton, superintendent, and consists of a drum type controller in the opening room which varies the external resistance in the rotor circuit of a 2-hp. slip ring induction motor driving bale breakers in a separate building. The bale breakers for No. 1 and No. 2 Mills are in the same room and are separately controlled. The two controls are duplicates and the description is the same for both.

The bale breaker room is about 500 feet away from No. 2 Mill. The baled cotton is fed by hand to two Kitson breakers and preparers driven by a 2-hp. slip ring induction motor, the speed of which is varied at will. Cotton goes to the opening room in the mill through a condenser

FOUR AUTOMATIC FEEDERS AT THE SPARTAN MILLS NO. 2, RECEIVING COTTON FROM THE BALE OPENER ROOM LOCATED 500 FEET AWAY AND SHOWN IN THE OTHER ILLUSTRATIONS. CONTROLLER FOR THE VARIABLE SPEED MOTOR IS LOCATED ON THE WALL AT THE LEFT OF THE PHOTO.

*With J. E. Sirrine, Engineer, Greenville, S. C.



Curve Showing Relationship Between the Controller Notches, the Speed of the Receiving Shaft on the Bale Breaker and the Amount of Cotton Handled.

and is delivered to the hoppers of four automatic feeders by a Morton distributor.

The controller and resistance for the 2-hp. bale breaker motor is located on the wall in this room where the operator can see all feeder hoppers. It has .37 ohms resistance between each notch. Cotton goes from the feeders through openers to the picker room on the floor above.

The Morton distributor does not have automatic features for the last feeder hopper, as no provision is made at that end for waste. This hopper has a sheet iron signal flag attached to the automatic feed regulator which remains horizontal as long as sufficient cotton is in the hopper and rises above horizontal when not enough cotton is fed. Noting the flag position, the operator varies the speed of bale breakers to suit.

In a test of the installation at No. 2 Mill each controller notch was given sufficient time of operation to allow the change in conditions to become effective, about three minutes being required for cotton to travel the 500 feet.

Test.

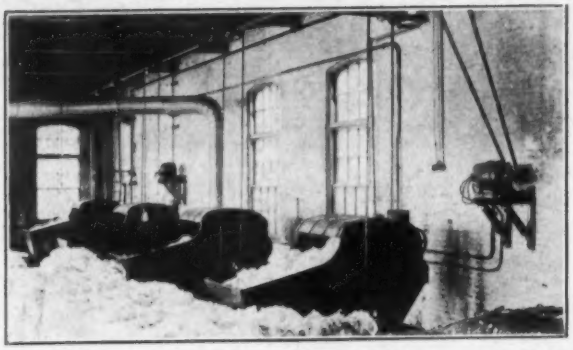
Controller Notch.	K. W. In-Put.	Motor R.P.M.	Receiving Shaft on Bale Breaker —R.P.M.	Number of Feeders Operating in open Room.	Pounds of Cotton per Hour.	Laps Per Hour.
1st	.925	516	113	2		
2nd	1.0	830	212	2	440	20
3rd	1.0	1109	293	3		
4th	1.05	1304	326	3	660	30
5th	1.075	1445	376	3		
6th	1.15	1600	416	4		
7th	1.15	1645	427	4	880	40
8th	1.20	1770	456	4		

With average conditions existing the second controller notch supplies the exact amount of cotton for the operation of two feeders. The 4th notch for three feeders, and 7th notch for four feeders. From the first notch to the 8th, the variation in the speed of the receiving shaft on the bale breakers is from 113 to 456 r.p.m., and this gives a variation in cotton handled of from 300 to 1,000 lbs. per hour or 70 per cent reduction. The greatest variation required is from 440 pounds per hour producing 20 laps, to 880 pounds per hour producing 40 laps.

The curve shows the relationship between the controller notches and the speed of the receiving shaft on the bale breaker and the amount of cotton handled.

Mr. Britton was requested to give a statement of what he considered the advantages derived from this control and his reply is quoted:

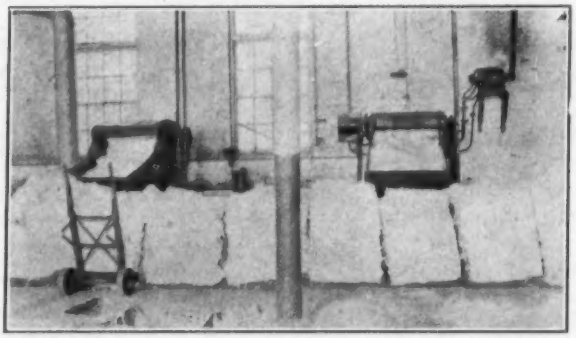
"It is a well known fact to all users of a distributor that a great deal of trouble is experienced by an uneven amount of cotton being fed to the self-feeders to which the distributor is attached, this variation being caused by the difference in the density of the baled cotton, the atmospheric conditions, and also irregularity in the feeding of the machines in the breaker room. This irregularity in the amount of cotton causes two troubles: In case there is more cotton being delivered to the distributor than the self-feeders require, the surplus falls on the floor, which entails in some instances considerable extra work by the operator, and also increases the fire hazard. On the other hand when the bale breakers fail to deliver enough cotton to keep all the hoppers supplied with the proper



BALE BREAKERS FOR NO. 2 SPARTAN MILL AND THE 2-HP. MOTOR.

amount of cotton, the hopper at the end of the line will run low, and in a great many cases run entirely out, necessitating a stoppage of one or two of the self-feeders to allow the feed to catch up the deficiency. Under this last condition when the hoppers begin to receive less cotton than they require, the weight of the receiver laps will be materially lighter than the standard weight.

"We had all these troubles, and to overcome them I installed a variable speed motor in the breaker room to run the breaker self-feeders. In the opening room, con-



BALE BREAKER ROOM AT THE SPARTAN MILLS SHOWING FOUR KITSON BREAKERS AND PREPARERS DRIVEN BY TWO 2-HP. SLIP RING INDUCTION MOTORS SUPPLYING COTTON TO MILLS 1 AND 2.

nected with this variable speed motor is located a controller. By the use of this controller the operator can at all times regulate the amount of cotton to be delivered, down to 50 per cent of normal.

"Our machines will run through a whole day with no cotton on the floor, and with none of the hoppers running light by simply setting the controller handle to meet actual conditions. Thus, we not only get evener work, but an ideally working opener room."

This system of control can be applied to any size installation. In some bale breaker rooms where the first opening process includes a beating up or cleaning operation, as with vertical openers, it is desirable to run this part of the equipment with a constant speed motor and applying the varying speed motor to the feeder mechanism only.

If smaller increments of speed change are desired a face plate controller can be used.

English Textile Schools.

In the early seventies England saw the advantage of textile education. They saw their continental competitors deriving a great deal of practical education from this source. As a result there are in Great Britain over 100 institutions of greater or less importance teaching textiles. Some of these textile schools were established through guilds, weaver's societies. These societies were formed for the education of the younger members of the guilds, etc. Sometimes these schools were formed from an association of workmen formed to advance technical education in their craft. But most of the modern schools have been established by the local authorities and the government at the suggestion of local manufacturing interests. They are managed by local authority such as the city or town and supported by local taxes plus government aid. The textile work is usually carried on as a department of the institution, the other departments being the arts and sciences.

The major portion of the British textile schools dealing with woolen and worsted are located at Yorkshire while those providing instruction in cotton is provided in Lancashire county.

Instruction is almost entirely in the evenings, only a small percentage of the schools having day departments. The fees for evening classes are in most cases nominal, and for the day classes, although higher, still insufficient to cover the cost of instruction. Since the appropriation was made for technical education by the Government, the grants from the City and Guilds of London Institute have been discontinued, but this Institute is still recognized as the controlling power over technical education in Great Britain. Its position is entirely unofficial, but it is tacitly recognized by all of the technical institutions of the country as the leading examining body. Its appointment of an examiner is accepted by all the institutions, and students from all the schools accept the decision of the Institute, in the matter of certificates or diplomas, as final and decisive.

New Name in Oxy-Acetylene Field.

The Oxweld Acetylene Company, of Newark, N. J., and Chicago, has recently extended its manufacture of oxy-acetylene apparatus and equipment to include "Eveready" welding and cutting outfits. "Eveready" is a new name in the oxy-acetylene field, but the apparatus is not new, excepting for certain refinements of design, having been used extensively in the metal-working trades for several years under the name of "Prest-O-Lite" apparatus. The new name was adopted by the Oxweld company to suggest the ready convenience, adaptability and general-purpose uses of the equipment. The apparatus is designed to use exclusively with compressed acetylene in cylinders, thus providing the welder and cutter a compact and complete portable outfit. Eveready outfits and supplies are moderately priced and are sold through distributors direct to the retail trade.

Success in any project rarely ever comes all at once. Almost everything worth while is the result of much consideration and experiment. Don't get disheartened because you failed the first or second time in any worthy direction. Stick to your job; if it is not already worth having, make it so.

"At Owner's Risk"

BY LESLIE CHILDS.

The question of the warehouseman's right to restrict or limit his liability, for damage or destruction of goods entrusted to his care, by inserting exemption clauses in the receipt given, has frequently been before the courts. These decisions are not entirely uniform on all points, but their general trend indicate conclusively that any destruction of a warehouseman's liability, inserted in the receipt, will be strictly construed.

Owing to the great number of decided cases bearing in some manner upon the question it becomes difficult, if not impossible, to formulate a general rule that would govern in all situations. And it is probable that an examination of one representative case in this class would be of more profit, in determining what the law permits, than any amount of generalizations taken from the many. A case of this kind was that of the Gulf Compress Company vs. Harrington, 90 Ark. 256, the facts involved being substantially as follows:

The Gulf Compress Company operated a warehouse at Little Rock ,Arkansas. W. E. Harrington stored thirty-two bales of cotton with them, and received receipts for the same in the following form.

> "Received on account of W. E. Harrington one bale of cotton, marked as stated herein, on storage, to be delivered to bearer only upon the return of this receipt and the payment of all advances and such charges as may have accrued under the current tariff of this company. Not responsible for loss by fire, acts of Providence, natural shrinkage, old damage, or failure to note concealed damage."

Thereafter the warehouse caught fire and Harrington's cotton was destroyed. Harrington thereupon brought suit for damages alleging that the warehouse company had been guilty of negligence in permitting the cotton to be destroyed by fire.

The warehouse company, after denying negligence on their part, set up that, under the provisions of their receipt, they were not liable for the destruction of the cotton by fire, even though they had been negligent. Contending that the clause in the receipt they gave, "not responsible for loss by fire, etc.," absolutely protected them from liability for a loss caused by fire.

The trial in the lower court resulted in a judgment in favor of Harrington, founded upon a finding that the warehouse company had been guilty of negligence which caused the destruction of the cotton by fire. From this judgment the warehouse company prosecuted an appeal to the supreme court; and in passing upon the issue raised, and speaking about the construction to be placed upon the clause in the warehouse company's receipt freeing them from liability for loss caused by fire, the court among other things said.

"* * * It will be observed that nothing is expressly said in the receipt about exemption from liability for negligence. It provides in general terms that there shall be no responsibility 'for loss by fire, acts of Providence, natural shrinkage, old damage, or for failure to note concealed damage'. Does this exemption include negligence of the obligor?

"The receipt issued is in the form prepared by the defendant (warehouse company) itself. The exemption set forth therein is couched in language of its own selection, and, according to well settled rules of interpretation, should be construed in the strongest light against it."

The court next reviewed a number of cases from other states in which similar clauses had been held not to protect the warehouseman from loss caused by his own negligence. Then addressing itself to the case at bar continued.

"A warehouseman is no insurer against damage to property held for storage, and is liable only for damage caused by negligence. But this argument affords no reason for importing into the contract a stipulation for exemption from liability for negligence which the parties themselves have not seen fit to express in apt words,—a stipulation, too, which the law at least discourages when it does not positively forbid. If a stipulation against liability for negligence had been intended, we must assume that it would have been more aptly expressed in the contract. We hold that the contracts in question do not contain such exemption. * * *"

The court thereupon affirmed the judgment rendered in the lower court in favor of Harrington. Holding, that as the finding in the lower court had been that the warehouse company had caused the loss by fire through negligence, the clause in the receipt exempting them from loss by fire would not exempt them.

The opinion in the foregoing case is in accord with the weight of authority on the question. In numerous other cases such clauses as, "at owner's risk," "no liability for fire," etc., have been held not to exempt the warehouseman issuing them from liability for loss caused by his own negligence.

It will be noted that the court, in the case reviewed, did not say that a receipt could not be framed that would exempt the giver from liability for his own negligence. It simply held that the receipt under consideration failed to give exemption. Leaving the question as to the effectiveness of a receipt, exempting the giver from liability for his own acts of negligence, an open question.

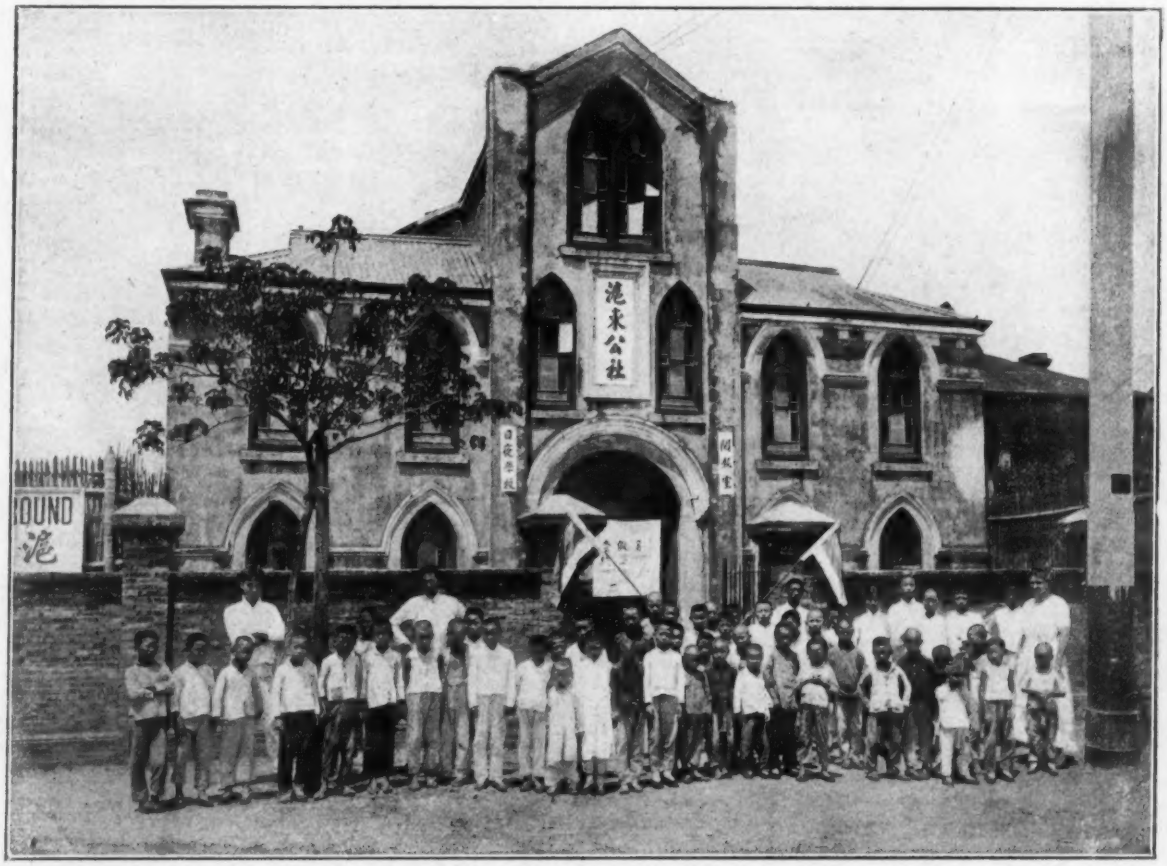
Whether or not a warehouse receipt, exempting the giver from liability for loss caused by his own negligence, would be generally upheld is a debatable question. One thing is sure, if such a receipt is to be effective it will have to be drawn in very plain, exact, language, stating clearly that its purpose is to exempt from liability for negligence, for in the light of the decisions on the point, it can hope for no assistance from the courts in construing it.

Human progress goes hand in hand with human wants. When the ox became too slow for travel, man invented the railroad; when the mails became inadequate as a communicant, he invented the telegraph. Many a flourishing business is the discovery of some Columbus who coveted the impossible.

The Yangtzepoo Community Center for Cotton Mill Workers

BY BEN Y. LEE.*

America has trained many Chinese youths in its textile institutions, thus enabling them to take an active part in the Chinese textile world. America has equipped, within a short period, many Chinese cotton mills with American machinery, amounting to more than a third of the total number of spindles in operation in China before the end of 1920. America has obtained a great share in the cotton piece goods trade from Canton to Manchuria. In fact America has done its utmost to uplift the Chinese textile industry both from within and from without. But feeling that enough hasn't been done, America now wants to do more for the welfare of the Chinese mill workers, hence the Social Center described in this article has been originated.

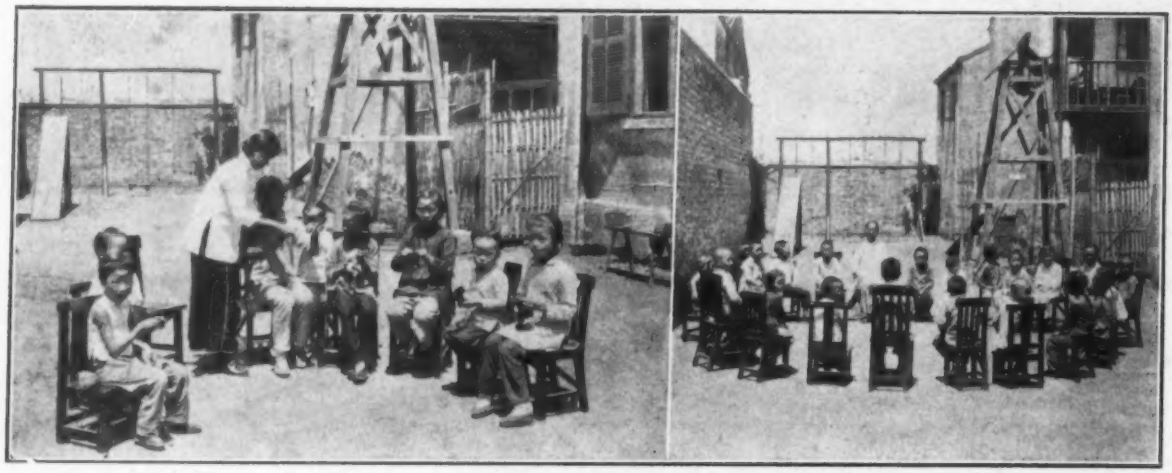


THE MAIN BUILDING OF THE COMMUNITY CENTER.

It is an outgrowth of the sociology department of the Shanghai Baptist College, which, as its name indicates, was founded in 1917 by American Baptist missionaries and is being financed by the Baptist churches in America. Its general director is Daniel H. Kulp, head of that department, and its active workers are the faculty and students of the college. On its directing committees and among its patrons and supporters, however, are some of the leading Chinese and foreigners in Shanghai. And a significant fact is the cooperation and support that is being given the idea by the heads of cotton mills in this district, J. Kerfoot, an English textile expert of the Ewo Cotton Mill, and C. C. Nieh and H. Y. Moh, two influential figures in the Chinese cotton mill industry, being among the members of the committee on development.

The aim and ideal of the settlement and social center in England and America is, in a word, community realization. That also is the object of the Yangtzepoo Club for mill workers. It represents the introduction into this country of the Occidental settlement idea; it will reach out and touch the community in various ways, and it aims to meet the needs of the district undergoing industrial transformation. It is to integrate the huge untouched district of Yangtzepoo, to give to it self-consciousness and self-direction, to bring out a feeling of community identity, that the Center will direct its efforts. The Center is the first attempt to introduce the social settlement and recreation center idea into China. The readers of COTTON already

*Textile Department, Andersen, Meyer & Co., Ltd., Shanghai.



At Left, a Girls' Class in Knitting. A Kindergarten Class at the Right.. These are Views Taken in the Summer.

know more or less about the laboring conditions in the cotton mills of China and therefore I shall not write any more about them.

Yangtzepoo, being a suburb of Shanghai, the greatest textile center in the Orient, is connected to the latter by trolley line. It is in Yangtzepoo that the transformation of China from an essentially agricultural nation to what may be one of the greater industrial nations in the world is being begun. In that district you will find even now more than a dozen textile plants including ten big cotton mills, employing more than 20,000 men, women and children. The dislocation in Chinese life this change has brought can easily be understood by any one who has visited the large cotton mill districts in England and America. That dislocation makes crying needs, and will make more. It is to make some effort to fit the community to meet these needs, to make its new adjustments, that the Yangtzepoo Center will bend its energies.

The following cotton mills are supporting the Center:

Name of Mill.	Management	No. of Spindles	No. of Looms.
Shanghai Cotton Mills, Nos. 1, 2, 3.	Japanese	86,000	1,524
Hou Sung Mill	Chinese	50,000	400
Deh Dah	Chinese	26,000	
San Sing	Chin. & Br.	67,000	1,000
Yangtzepoo	British	55,632	400
Ewo Cotton Mill	British	73,952	712
Heng Feng	Chinese	38,144	450
Anglo-Chinese	Chinese	13,548	
Oriental	Japanese	50,768	
Total:		455,044	4,486

The actual work of the Center can be divided roughly into: (1) Recreation, consisting of playground, play rooms, club rooms, music and dramatics; (2) Education, consisting of day school and kindergarten, night school, illustrated lectures and reading room; (3) Medical social service, consisting of dispensary and visiting nurses; (4) Religion, consisting of church service, Sunday school and bible classes.

Under the first heading is the important work of the playground for children. Of the value of organized and supervised play for children the work done by the American

The Teaching Staff at the Summer School.

An Upper Class for Girl Operatives.

settlement is ample proof. For the children, then, there are see-saws, swings and similar apparatus—all outdoors, of course; itself a great new influence in Chinese life. Also, there is a summer school supervised by a play expert. Electric lights outdoors are being installed in the playground so that night games for day workers may be or-

ganized, hand-ball, volley ball, football and the like. Recreation, however, is not all physical. It is also mental and aesthetic. Plays and musicals are sometimes given, and there is always the moving picture.

The educational activities are manifold. The day school is attended by more than two hundred students, all of whom are either children workers or children of the mill workers. The school charges a small tuition on students who are paid by the respective mills. A girl's school giving courses in vocational as well as general subjects has started. Aside from school, there is a reading room, with newspapers, both foreign and Chinese, as well as books and magazines. There will be popular lectures from time to time and interesting as well as educational moving picture films are being shown. If possible there will be similar lectures in the dining rooms of the mills during the lunch hour.

Not less important than any thing else is the medical work. Under the supervision of Dr. Huntley of the College a dispensary was opened. Medical supervision and dispensary service are provided in all mills, and the influence is extended even into the homes of the mill workers by

CHILDREN'S CLASS IN BASKET MAKING.

means of district visiting by Chinese nurses and doctors. When one considers what this will mean in child welfare alone, its tremendous importance can be realized.

But successful social enterprises are not only matters of vision and will; they are also financial problems. To do these things beneficial to both the mill employees and operators money is needed. To meet the financial question, each mill contributes a certain per cent of the total annual expenditure according to its number of spindles and looms. To be exact, the Center cost just $8,325 for the first year and the amount is much higher in the succeeding years. The spirit behind the work of the Center is what may be called China Industry-Christianity and all aiming is at one mark—community welfare for the cotton mill workers. The readers should remember that the organizers and pioneers of such philanthropic work are Americans who are supported in both finance and spirit by the cotton mills of this district. For this and many other noble works done in China, Americans receive more respect here than do any other nationality.

The more you can learn to like your work, the better time you will have while doing it.

The Pink Boll Worm.

Once more the question of eradicating the pink boll worm has come into prominence. Louisiana and Texas on the one hand and the government on the other are chiefly concerned. Attempts have been made to minimize the seriousness of the invasion of the cotton belt by this worst pest of the crop. At least, attempts have been made to prove that the pest does not exist in the country. But the Government will have none of this if it can be helped.

The Secretary of Agriculture recently issued a lengthy statement on the pink boll worm situation in which it was said that "there have been many misstatements about the pink boll worm and its importance which have resulted from propaganda against any control work whatsoever with respect to it. The more important of these statements are that the insect is an old and well known cotton pest in Texas and throughout the South and that it is comparatively unimportant in its effect on the cotton crop, or that, granting perhaps that we have a new pest in the pink boll worm, it at least has not occasioned any damage to the cotton crop in Texas or elsewhere and is a negligible factor.

"That the pink boll worm is an entirely different insect and actually exists in the district in question is based on adequate and conclusive determination by the experts of this Department and of the Division of Insects of the National Museum at Washington. The history of the insect also is well known—its origin in India, its spread to Egypt, and from thence, with seed distributed over the world for planting, to practically every other cotton-growing country. The enormous losses which it is now causing in Egypt, Brazil, Mexico, the Hawaiian Islands, China, etc., are also matters of official estimates and records.

"It must be borne in mind that the invasion is now at a stage where extermination is possible and that this opportunity will have passed completely if the effort at control is stopped, or materially lessened, until the insect has become widespread and has had time to bring about, to any degree, the maximum amount of damage which it has caused in other countries and which it will undoubtedly ultimately cause in Texas and elsewhere in the South if it is not exterminated."

Subsequent to the publication of this report, a hearing was held in Washington and hot discussion was aroused. The meeting was before the Horticultural Board, on proposals to impose a Federal quarantine against the pest in Texas and Louisiana. Chairman Marlatt of the Board and members of the Texas delegation, which included Governor Hobby, had several exchanges over the failure of Texas and residents along the Mexican border to make effective the non-cotton zone originally established against the pest.

Permission was asked by the Texans to grow cotton in the region this year, with an agreement to abolish cotton in it next year if the boll worm were found. The trouble with this sort of an agreement, said Chairman Marlatt, is that we have tried it before. "We signed the people up to an agreement in the zone that, if the worm did appear they would cease growing cotton. Now that it has appeared, they have considered that agreement a scrap of paper and have gone ahead to plant cotton. The lure of the crop will be just as great next year as it is now."

It was proposed by the Texans that cotton be grown in the zone this year, under strict inspection and quarantine, with the pledge that, meanwhile, the Legislature

would be assembled and that in 1921 the growth of cotton in the infected area would be prohibited. "We appreciate the grounds upon which this proposal rests," said Chairman Marlatt, "but it means a year of time lost, an opportunity given to the pest to spread all over the cotton territory." An entomologist interrupted to state that "one storm could scatter it a hundred miles."

One of the representatives from Louisiana told the conference that "the growers aren't demanding a cent." In contrast with this attitude, Mr. Marlatt stated that "there is a pest spot including one per cent of Texas that is a menace to the other 99 per cent, and yet the state seems ready to stand as a unit in protecting it."

At another stage of the hearing Chairman Marlatt said: "What's the use of wandering about the bush. The question is whether the state of Texas is going to meet its responsibility and do it in time. The Governor can call a special session of the Legislature now and secure the proper legislation and appropriation. We put the matter up to Louisiana and they didn't wait overnight. The only question is whether the State wants to take advantage of the opportunity to exterminate the pest. If Texas fails to do that the Department of Agriculture will not take the responsibility. The Federal Government has furnished the money to fight the pest, has shown the method of eradicating it and has furnished the personnel; we can do no more."

Previous to this hearing, the Department of Agriculture put out a statement to the effect that, unless preventive measure be taken immediately, the worm will become a permanent and seriously limiting factor in the production of cotton. The drastic quarantine now being enforced in Louisana, it said, gives hope of an eradication of the pest in that section, but the "unfortunate result" of the resumption of cotton growing in Texas districts where the boll worm has become entrenched threatens to undo the work of stamping out the destroyer.

"As a result of the failure of the state of Texas to carry out the program of control which had been promised if the insect should reappear, a new and very serious phase of the situation developed early in 1920. The one drawback to success now is the delay in Texas in establishing non-cotton zones for the infected areas, a delay which already has resulted in the planting of considerable areas. Destruction of this cotton later on, if authorized by the state, will simply mean that much greater cost."

At a meeting of farmers of the seven counties in Texas involved in the proposed non-cotton areas, held just previous to the publication of the report just mentioned, R. R. Dancy, operator of a gin in Houston, declared that he questioned if anyone present had ever seen a pink boll worm. "I further question if anyone in Texas has ever seen one," he said. "The Government agents have fumigated my plant up one side and down the other, and not a worm has been found."

It is high time, he asserted, that somebody took action to show to Texas and the rest of the world that no damage had been done by the "so-called" pink boll worm. It was asserted by others that the worm found by entomologists in Southwest Texas is also to be found in other sections of the state and always has existed there.

Correlated with the growing situation in the South and the danger of the pink boll worm is the fumigation of Egyptian cotton in the North, especially at Boston. The movement of Egyptian cotton to this country is of record proportions. Boston has had difficulty in handling the immense volume of wool brought here since the beginning of the year, owing to transportation being hampered and other things being difficult. This has complicated fumigation and shipment to mills.

In view of the exigency, cotton importers sought to have the Federal Horticultural Board of the Department of Agriculture suspend temporarily the fumigation requirement, as a means of relieving the congestion quickly. This, of course, was refused for the reason that fumigation of the cotton imported is for the same purpose as the proposed non-cotton zones in the South, viz., to avoid all danger of the pink boll worm spreading through the United States.

As a result of the hearing conducted by the Federal Horticultural Board and after consultation with the governor and other authorities and representatives of the state of Texas, and with official and other representatives of the state of Louisana, the Board recommended to the Secretary of Agriculture a quarantine and restrictive action to be enforced by these states in cooperation with the department with the object of preventing the further spread and effecting the extermination of the pest. The prompt carrying out of these plans has been definitely promised by the official representatives of these states.

The governor and other authorities of Louisiana have already taken steps to provide and enforce such non-cotton zone and also for the reimbursement of the losses of planters in such zone as a result of this action, and the governor of Texas has agreed for the state to promulgate immediately the non-cotton zones indicated and that he will convene the state legislature in extraordinary session during May for the purpose of making such amendments as may be necessary to the Pink Bollworm Act of the state to carry out the action indicated and to make provision by specific appropriation of state moneys for the reimbursement of planters in non-cotton zones for the losses which they may sustain as a result of the prohibition of the growth of cotton and for the reimbursement of such planters for cotton actually produced in 1919 and which has already been destroyed in control operations with respect to the pink bollworm.

It is proposed that these quarantines and restrictions covering movement of products out of the non-cotton and regulated zones of the states of Texas and Louisiana shall apply to all cotton products other than oil, including seed cotton and cotton lint—baled or unbaled—cotton seed, cottonseed hulls, cotton seed cake and meal, bagging and other containers that have been used with respect to cotton, and shall include also provision for such inspection and cleaning of common carriers, vehicles, etc., as may be necessary to prevent the accidental transportation of cotton seed.

The Department believes, and has been tentatively so advised, that this action on the part of Texas and Louisiana as cooperated in by the Federal Department of Agriculture will make it possible for the other cotton states of the South which have already issued quarantines or are contemplating issuing such quarantines against Texas and Louisiana on account of the pink bollworm to accept the Federal quarantine as fully meeting the needs or at least to limit such quarantine action to the areas and products covered by the Federal quarantine and by the quarantine promulgated by the states of Texas and Louisiana.

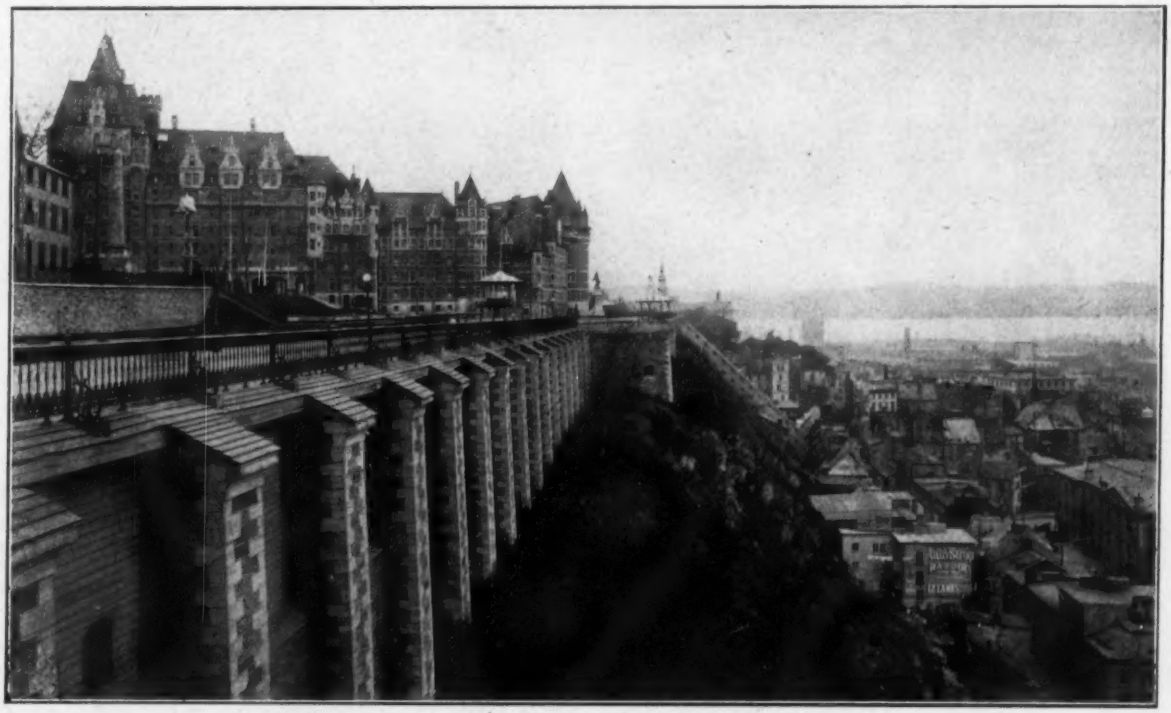
Quebec—The Convention City

It is generally conceded that the Executive Committee of the Georgia Cotton Manufacturers' Association made a happy decision when they selected Quebec as the convention city for 1920. Uprising Gibraltar-like from the wide St. Lawrence river Quebec city seems not so much a city as a fortification crowned by battlements. Slowly the details emerge, and the various buildings detach themselves from rampart and bastion, as these become separated from the shelving rock of Cape Diamond. There is a shadowy mass of houses, close to the base of the rock, slowly climbing up Mountain Hill, to the level of the Grand Battery and beyond. There is Laval University and the Seminary, the Governor's Garden, the Post Office, the monument to Champlain, the Chateau Frontenac, the long line of Dufferin Terrace overhanging the cliff, with its kiosks and the Wolfe-Montcalm Monument, and above these the Citadel.

In the Chateau Frontenac the city possesses a hostelry which for beauty of site and luxuriousness of appointment, cannot anywhere be surpassed. It is a magnificient tourist hotel, operated by the Canadian Pacific Railway Company, and stands at the eastern end of a splendid esplanade known as the Dufferin Terrace, just below the King's Bastion of the Citadel, commanding delightful views of the St. Lawrence as far as the eye can reach—down past the Isle of Orleans, across to Levis and beyond, up stream to Sillery; and, to the left, the country along the beautiful valley of the St. Lawrence River. No grander site for a hotel could be found on the continent. It is erected on a historic spot of more than ordinary interest—the site of the Chateau St. Louis, so famous in Canadian history, and once the vice-regal residence of Governors of Canada.

And what a view you may have from your window at the Chateau Frontenac, or from the Terrace upon a summer afternoon! Beneath you are clustered the sag-roofed houses of the Lower Town—a veritable bit of Normandy, with quaint dormer windows, wooden bridges from roof to roof, chimneys and coigns hugging the dark rocks, and streets of the narrowest. Beyond is the wide splendor of the St. Lawrence, dotted with ships and steamers and red-sailed smaller craft. And then as a background are the populous heights of Levis, the gentle Isle of Orleans, the villages of the Cote de Beaupre, and ranges of mountains in perspective, wearing their clouds like mantles.

Quebec is filled with places of historic interest. Its appeal is world-wide. Perhaps the chief attraction to many visitors is the scene of the famous battle (September 13th, 1759) on the Heights of Abraham, where both the English and French commanders, Wolfe and Montcalm, lost their lives.



CHATEAU FRONTENAC, THE CONVENTION HEADQUARTERS.

The Falls of Montmorency are about seven miles below Quebec, and comprise the most interesting of all the natural objects in its vicinity, which no stranger leaves without seeing. Passing on the way the ruins of the old Palace of the French Intendants, the tourist reaches the quaint old straggling and picturesque village of Beauport, which is beautified by rows of white cottages and garden patches, and affords a very striking illustration of primitive French-Canadian life and manners. Down a precipice of over two hundred and fifty feet the Montmorency River plunges into the St. Lawrence.

About twenty-one miles east of Quebec is the Anne de Beaupre, the most famous shrine in the New World. The interior of the Basilica is heaped high with the crutches and sticks of the cripples who have come here to be cured. It is said that nearly a quarter of a million pilgrims visit Ste. Anne each year. The haunting melody of the pilgrims' hymn is one of the most interesting memories which one can carry away from this French-Canadian province.

Besides the Basilica there are attractions ,as, for instance, the Scala Sancta or Holy Stairs, a chapel erected in 1893, to which one must ascend on his or her knees. The stairs are a wooden facsimile of the celebrated twenty-eight steps of white marble in the Vatican brought by the Pope in the fourth century from Jerusalem, where they are said to have led to the Pretorium where Christ was judged by Pilate. Each step encloses a relic of the Holy Land, and upon each stair the ascending pilgrim pauses to pray or meditate. Close at hand, by the roadside is a stone grotto containing an image of Ste. Anne and a spring of clear water from which pilgrims fill bottles.

Montmorency Falls and Ste. Anne de Beaupre can be reached from Quebec by electric line or motor car over a fairly good road.

The tentative schedule as now promulgated arranges for the party to leave Atlanta in special pullman cars on Saturday afternoon, June 26, via Cincinnati to Detroit, arriving about 4 p. m., June 27. Crossing the line at this point a special train on the Canadian Pacific Railway will be awaiting them which will leave about 7:30 p. m. for Montreal, where they will arrive about 1 p. m. on Monday, June 28. Here the train will be parked allowing the visitors time to look around the city and visit the top of Mount Royal. The evening may be spent visiting some of the many theatres as the train is scheduled to leave at 11:45 p. m., arriving in Quebec at 6:30 a, m, on the morning of Tuesday, June 29.

It might be well to state at this point that the rates at the Frontenac will be from $6.00 to $10.00 a day for a double room, according to location. Any one receiving an invitation and desiring to remain at Quebec and the Frontenac longer than the two days of the convention should so advise Secretary Glenn when making reservations for the trip, otherwise the space will be sold to others from and after July first.

After the convention, for which an interesting program is being arranged, visits to local points of interest will be made as individuals or small parties may desire.

On the return trip many optional parties are being arranged. Some members are planning to vacation in the White Mountain district of New Hampshire. For those who like fishing, the Maine lakes are not far distant, while the Laurentian Mountain region northwest of Montreal presents a picturesque district full of attraction for the summer visitor.

The St. Johns and Lake Champlain section also offers many advantages and an attractive trip is being arranged down Lake Champlain and Lake George to Saratoga Springs, N. Y., thence to the Hudson River, securing the daylight trip down the Hudson to New York City, returning via Washington to Atlanta.

Another return trip that is likely to prove popular is a daylight trip to Montreal, thence by steamer up the St. Lawrence through the locks to Prescott. From this point a larger boat is taken giving a daylight sail through the beautiful Thousand Islands and a cool night trip across Lake Ontario arriving in Toronto about 7 a. m. for breakfast. Here another boat is boarded for Lewistown, N. Y., from which point the party will proceed by electric cars through the gorge of the Niagara River, passing the famous rapids, to Niagara Falls. Leaving for Buffalo late in the afternoon, the party will board the steamer for Cleveland spending another cool night on Lake Erie. Arriving at Cleveland, arrangements will be made to transport the visitors to several of the large steel working plants and other points of interest around the city. Then by rail, via Cincinnati to Atlanta.

Textiles in Belgium.

Spinning and weaving mills in Flanders are rapidly approaching normal production—the cotton spinning mills have reached 75 per cent of their pre-war capacity. This means the actual number of spindles in operation, as the reduction of working hours from 11 to 9 has reduced the power of production by 20 per cent. It has been impossible to recover from Germany certain equipment—copper parts and belting—but its replacement is progressing satisfactorily. The number of cotton looms in operation has reached 60 per cent of the number in operation in 1913.

Wages have been increased 150 per cent. About 90 per cent of the workmen are unionized and a spirit of satisfaction seems to prevail among them.

Mills are booked well ahead with orders, including shipments to Holland, England, France and South America—45 per cent of Belgium's textiles were exported before the war.

Short staple American and Indian cotton is used. The financing of these purchases requires about 300,000,000 francs annually, but owing to the frequent turnover a much smaller amount is actually required at one time, and this has been fortheoming regularly.

The flax spinning and weaving mills of Flanders have resumed 50 per cent. The first shipment of Russian flax has been received by the flax spinners of Ghent and other shipments are now *en route*. Belgium produces a high grade of flax, a large part of which is exported to England and other linen manufacturing countries. In July, 1919, 100,000 spindles, as compared with 375,000 in 1913, were in operation. The latest figures show that the flax spinning and weaving mills of Flanders have jointly resumed about 50 per cent.

In the Verviers district the wool industry has resumed 75 per cent.

In the artificial silk inlustry 75 per cent of the number of men employed before the war have been able to return to work.

For cotton piece goods, Breton Minerol "F" produces a light finish with a silky "handle." It may be used alone for finishing mulls, soft shirtings and poplins. For finishing starched shirtings, sheetings, cambrics and similar goods it produces a pleasing, thin, soft finish. Its use in all starched goods, especially those heavily filled, keeps the guides and stretchers clean and prevents "pick ups" on the cans. For ducks and heavy suiting, it is claimed its use is unexecelled.

Aniline and Its Uses in the Dyeing and Calico Printing Trade

BY WILLIAM B. NANSON.

PART TWO.

Oxidized Aniline Black.

The oxidation of aniline into aniline black has been a matter of much study and experiment. If oxidized in alkaline solutions the result has been azolenzine. With arsenic acid the result is violanine. With chromic acid it is converted into quinone. Chlorates in the presence of metallic salts such as copper, vanadium and cerium convert it into aniline black. Potassium permanganate oxidizes it into nitrobenzene if the solution is neutral, but if the solution be alkaline it is oxidized into azobenzene.

As a rule, the oxidation of aniline is brought about by means of a sodium chlorate in the presence of suitable oxygen carriers such as copper sulphide, vanadium chloride or potassium ferrocyanide. Copper and vanadium blacks are usually developed by being aged in a moderately warm room for a day or two, which converts the color by oxidation into emeraldine and probably further into nigraline, at which stage they are taken down and run through a hot solution of bichromate of soda or potash to complete the oxidation of the nigraline into ungreenable aniline black. The chemistry of aniline black is still but imperfectly understood, but it looks as though there were at least three stages of oxidation products of aniline, the first is a dark green substance which is turned blue by an alkaline treatment, this is called azurine and is in the nature of a salt. A further stage of oxidation produces emeraldine and later nigraline, this is also a dark green salt but its free base has a violet black color. This latter becomes green under the influence of acids, especially sulphuric acid, and this explains the reason why some blacks turn green during exposure to the air, but by a supplementary oxidation with bichromate of potash or soda they turn into an ungreenable black, the nigraline salt being peroxidized into the highest or last stage of oxidation and a perfectly stable aniline black is the result.

At the best, aniline black is of a rather indefinite nature and differs remarkably from the other aniline colors, as it is quite insoluble in water and alcohol, in soap lye, and in acid or alkaline solutions, so that it has to be formed on the fiber itself. It gives a deep velvety shade on cotton, which is changed to a dull green by the action of acids, and restored again to its original color by alkaline solutions. Dilute solutions of potassium dichromate intensify the color, and hypochlorites slowly destroy it. If, however, an aniline black be submitted to the action of a solution containing a hypochlorite merely until it acquires a red shade, and is then washed and exposed to the air, it slowly becomes black again.

The composition of aniline black is not definitely known, neither is its mode of formation thoroughly understood. It seems probable, however, that it consists of two colors, one a brown black produced by the action of chlorinating agents on the aniline salt, the other an intense violet blue black which is perhaps a product of the oxidation of the aniline salt. The former is the more stable, resisting the action of almost all chemical agents, while the latter, although it resists soaping, is turned green by a trace of free acid. These two colors combined form ordinary aniline black.

According to Brandt, the composition of the aniline blacks fixed upon fibrous materials differs greatly according to the process employed, as is evident from the manner in which they withstand the action of light and of chemical agents. The more intense the black, the better does it resist the agents which are likely to produce this change. A black which has been formed in the presence of an excess of aniline is always faster than one formed where the acid is in excess, the latter being apt to turn green. However, as sodium decomposes but slowly in the presence of an excess of aniline, it is advisable to substitute for it, in this case, aniline chlorate or lactate; the development of the color also takes place much more rapidly since the chlorate or lactate of aniline itself is applied to the cloth, instead of being formed by double decomposition between the aniline hydrochloride and the sodium chlorate.

Some aniline blacks resist the action of chemical agents extremely well, while others readily turn olive green in contact with air containing sulphurous fumes (soft coal) so that if the gas, used in a warehouse where goods dyed or printed with aniline black are stored, should contain a little sulphur, as it nearly always does, the folds of all the pieces will be turned green, more or less, by the sulphurous anhydride produced.

Aniline black may be considered as the result of the mixture of colors produced by two different reactions, namely, the decomposition of the aniline chlorate and of the oxidation of the aniline itself. By the decomposition of the aniline chlorate, chlorinated substitution products of aniline are formed, and the various degrees of substitution which may take place would offer a probable explanation of the different results obtained.

The presence of copper has generally been regarded as essential to the production of aniline black but there are other metals which are capable of replacing it in this curious reaction. Of all the metals that have been used, however, the best black was produced by vanadium, the next by copper, then uranium and lastly iron. The other metals gave but little color, or none at all.

Aniline black is a powerful base to which has been given the name of "nigraline." When a cotton has been immersed in a solution of aniline hydrochloride and sodium chlorate containing a little cupric chloride and then exposed to the air, it acquires a dark green color, which on treatment with alkalis changes to violet black. The dark green compound is the hydrochloric of the base from which the hydrochloric acid may be removed by soda or ammonia leaving the black base. This base is more powerful than aniline, and expels it from its salts; so that if a piece of cotton lightly dyed as described and then treated with an alkali be immersed in a solution of aniline hydrochlo-

ride it immediately takes a green tinge, even if the aniline is in excess.

In dyeing with aniline black, the nature of the aniline is a matter of considerable moment as neither pure aniline nor pure toluidine gives the best results. The aniline oils generally used for dyeing black usually contain about 60 to 65 per cent of pure aniline which boils at 356 to 365 degrees F. and has a specific gravity of from 2.75 to 3.4 degrees Baume. About 18 to 22 per cent of a mixture of aniline and toluidine which boils at 365 to 378 degrees F. and has a specific gravity of from 1.6 to 2.1 degrees Baume. And about 8 or 9 per cent of nearly pure toluidine which boils at 378 to 388 degrees F. and with a specific gravity of .0 to 1 degree Baume. There is also a residue of about 4 to 6 per cent consis ing of various substances. Anilines boiling at temperature varying from 356 to 365 degrees F. yield intense and brilliant blacks. Anilines boiling at 365 to 378 degrees F. also give good blacks but with a blue cast. Commercial toluidines and aniline oil boiling above 378 degrees F. give unsatisfactory shades of a brownish cast.

Toluidine has a decidedly injurious effect on the color if it is present in too large a quantity, it has, however, a comparatively low density, therefore it will be evident that the specific gravity of the aniline oil will indicate its value for producing aniline black. If the specific gravity of the oil is above 3.5 degrees Baume it will be generally found to contain nitrobenzene. Anilines of from 2 to 3.5 degrees Baume give satisfactory blacks, while if below 2 degrees they contain too much toluidine.

The essential ingredients in our aniline black dye bath are aniline oil, a mineral acid and an oxidizing agent; but usually some mineral salt is also added; certain metals such as vandium, copper, uranium, manganese and iron having a most remarkable effect in inducing the oxidation of the aniline. The action of vanadium salts is particularly remarkable, one part of this metal being sufficient to transform 27,000 parts of aniline into black. The black is not produced in the absence of free acid, however, but a mere trace is sufficient to induce its formation. It must be remembered, however, that mixtures prepared with vanadium as a catalyst or oxygen carrier are far less stable than those prepared from copper salts.

As oxidizing agents chlorates and chromates are the most used, the metallic oxides serving as oxygen carriers or catalysts.

I have shown that aniline black is the product of the oxidation of aniline oil or aniline salt in an acid state of solution. For convenience in the dyehouse, it is customary to use the aniline as a hydrochloride or as it is usually called, aniline salt.

Aniline oil is a weak base and forms salts with the mineral acids. A mixture of aniline and hydrochloric acid forms a mass of colorless crystals, which become of a greenish cast on exposure to the air. This is the aniline salt of commerce.

Aniline salt, $C_6H_5NH_2HCL$, is prepared by mixing 100 parts of aniline oil with 133 parts of hydrochloric acid at 32 degrees Twaddle in a stoneware crock. The salt which crystallizes out is drained in a centrifugal machine and dried. The acid used must be free from iron or copper or the salt will be black.

It is the practice in some dyehouses, however, to convert the aniline oil into aniline salt themselves by adding the aniline oil to the hydrochloric acid separately and then adding it to the dyebath; this is done in preference to purchasing the aniline salt already made. If the dyer makes his own salt in the dyebath from aniline oil he will find it will give better results if made from a mixture of hydrochloric acid and sulphuric acid—a biacid solution gives a better black. It must be remembered in this connection that only one part of aniline oil is soluble in 31 parts of water, but that it dissolves in all proportions in a 50 per cent solution of aniline salt in water, hence, when commercial aniline salt is used, which always contains much free acid, it is customary to add aniline oil to the bath to combine with the free acid and prevent tendering of the goods.

In dyeing aniline black the cotton is immersed in a bath containing, as its essentials, aniline salt and potassium or sodium chlorate, with a little copper sulphate or other metallic salt as a catalyst which facilitates the production of the black by acting as an oxygen carrier between the sodium chlorate and the aniline salt. The goods are then dried, aged and passed through a chrome bath and finally soaped and washed.

While a good black is thus obtained a difficulty arises in the tendency of the cotton to become tendered from the use of too strongly acid solutions, or by the formation of oxycellulose caused by a too rapid or too strong oxidation. Then again, the color is apt to rub off through a too superficial penetration or fixation; also many anilines become green, if not properly dyed, by exposure to the sulphuric acid fumes existing in the air. In order to get over these difficulties there is often added to the dyeing liquor a small quantity of aniline oil or ammonium chloride.

Some dyers use acetic, formic or lactic acid as an addition to the bath so as to replace some of the mineral acids (hydrochloric and sulphuric) or some of the salts of these acids (acetate, formate and lactate of aniline) to replace some of the acid aniline (hydrochlorate). This has been a great improvement as it gives better and bloomier blacks and materially lessens the danger of tender goods. Lactic acid is now used very largely in aniline black dyeing both in acid form and as an aniline lactate. This last compound is readily prepared by mixing 2 pounds of lactic acid (50 per cent strong) with one pound of aniline oil.

With a given proportion of ingredients the formation of the black is accelerated by raising the temperature or by increasing the concentration of the bath, the bath must be developed slowly, however, or there may be a precipitation of the black in the dyebath and this superficial fixation causes the dyed fabric to "rub off" badly. Both a cold and warm process may be used, but when dyed in a warm solution the bath can be used more dilute and the amount of the oxidizing agent reduced.

Aniline black is extremely fast to light, bleaching and washing. The oxidation blacks are faster to rubbing than the same blacks dyed in a single bath, but they are not so fast to acids. It might be well to say here in regard to "rubbing off" that all aniline blacks, whether oxidized or single bath, when prepared by means of a chromate, always contain chromic oxide and may therefore be topped

with mordant dyes, which process reduces the liability to "rub off" and often entirely eliminates it. Another process which also serves to accomplish this same result and to produce a very fast black is to dye a medium shade with a one bath aniline black and then top with a direct cotton color, which may be fixed by a subsequent chroming or by diazotizing and developing.

Preparation of Goods for Aniline Black.

In preparing cotton goods for dyeing into aniline black, care must be taken against the formation of lime salts and against the formation of oxycellulose, either is fatal to a satisfactory black. In furtherance of this the goods should neither be lime boiled nor chemicked in chloride of lime. I would also say that the goods must be so prepared as to render them absorbent, and uniformly so in their ca-

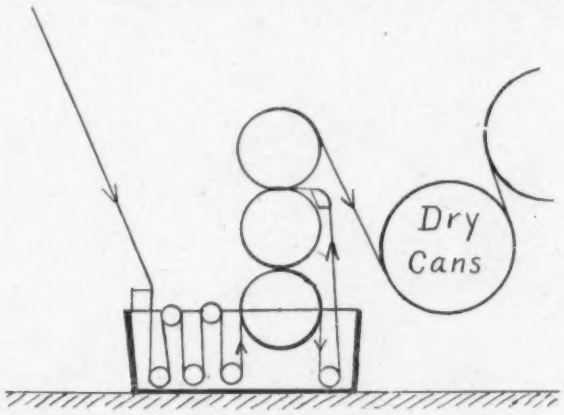


FIG. 1. A PADDING MACHINE.

pacity for absorbing and retaining moisture. This is to facilitate the necessary penetration and to allow the goods to absorb about their own weight of the padding mixture of aniline oil, salt, etc., this quantity being necessary for the development of a full bloomy black. The goods are run into the padder dry. For very low goods it is only necessary to steep in warm water overnight, wash and sour in hydrochloric acid, wash well and dry up.

For a medium quality prepare as above but with the addition of 5 pounds of diastofor to each 100 gallons of the steeping liquor.

For good qualities of goods, steep as in either of the above methods, wash into a kier and boil for 6 or 8 hours in a lye of 2 per cent of soda ash. Wash out of the kier and sour with hydrochloric acid at 2 degrees Twaddle, wash well and dry up.

By whatever method the goods are prepared, they should conform to the following test: After the final drying (before padding) allow the goods to thoroughly cool, prepare a pail of water of the same temperature as the air in the room, cut from the scoured goods a sample about one inch square with clean cut edges and thoroughly cool and dry; throw it down flat onto the surface of the water. If the goods are sufficiently scoured it will sink instantly without any hesitation.

After the goods are thoroughly and uniformly dried and cooled off they are run through the aniline mixture in a padding machine (Fig. 1) and directly onto drying cylinders from which they are either plaited down into trucks or continue on into the ageing and steaming apparatus. As previously stated, the weight or pressure on the padding machine should be such as to allow the goods to absorb about their own weight of the aniline mixture.

Strictly speaking, ageing consists in exposing the goods to the more or less prolonged action of a warm moist atmosphere. Experience has shown, however, that equally good results can be obtained in most cases by running the goods through hot steam, and, in consequence of this, the meaning of ageing has been extended to include such improved processes.

The objects of ageing are many and varied. Among them the following may be mentioned as the more important: (1) to promote the oxidation of the aniline black, (2) to effect the reduction of certain colors by one process and their subsequent reoxidation by another (see later), and (3) to provide necessary conditions under which certain oxidizing and reducing agents are capable of discharging the colors from those parts of a uniformly dyed fabric upon which they are printed. These two latter processes we shall discuss later under printing and discharging of aniline black.

Aniline blacks, which formerly took 6 hours to oxidize in the ageing rooms, can be fully developed on a rapid ager in 3 minutes. The temperature at which it is worked varies from 149 to 203 degrees F. with the dampness of the steam regulated to show 37.4 degrees F. less on the wet bulb thermometer. The lower temperature is employed for vanadium and copper blacks, either alone or in combination with iron and aluminum mordants and the higher temperature for prussiate blacks in all styles. The prussiate aniline black will stand a still greater heat than 203 degrees F. but without exhibiting any improvement in shade.

The goods are usually run at a speed of 60 yards per minute and at this speed it takes about three minutes to pass them through the ager. When the quick ager was first introduced for the oxidation of aniline black a good deal of trouble was experienced from the extreme liability of the cloth to become tender. This defect was found to be caused, not by any inherent defect in the machine itself, but by too great a percentage of free acid in the color. The free acid thus liberated rapidly destroyed the cloth at the temperature at which the operation was performed. A modification of the composition of the color by the use of lactic and formic acids in place of the excess acid was all that was required to remedy the defect and now when tendering of the cloth does occur, it may be safely attributed to one of the following causes: (1) the acidity of the color, (2) too great a heat in the ager, and (3) to the goods being allowed to stay too long inside, i. e., not passing through the ager quickly enough.

The ager itself (Fig. 2) consists of a chamber made of cast iron plates which are bolted together and it is made in various lengths from 9 to 18 feet according to the production required, and is usually about 9 feet high. The cloth enters and leaves the machine through the same opening, which is provided with two steam pipes, fixed longitudinally to prevent drops of condensed water forming and falling on the cloth, which would cause whitish or greenish spots on the finished goods.

The rollers over which the cloth passes are made of seamless drawn copper tubes, 5 inches in diameter, and in

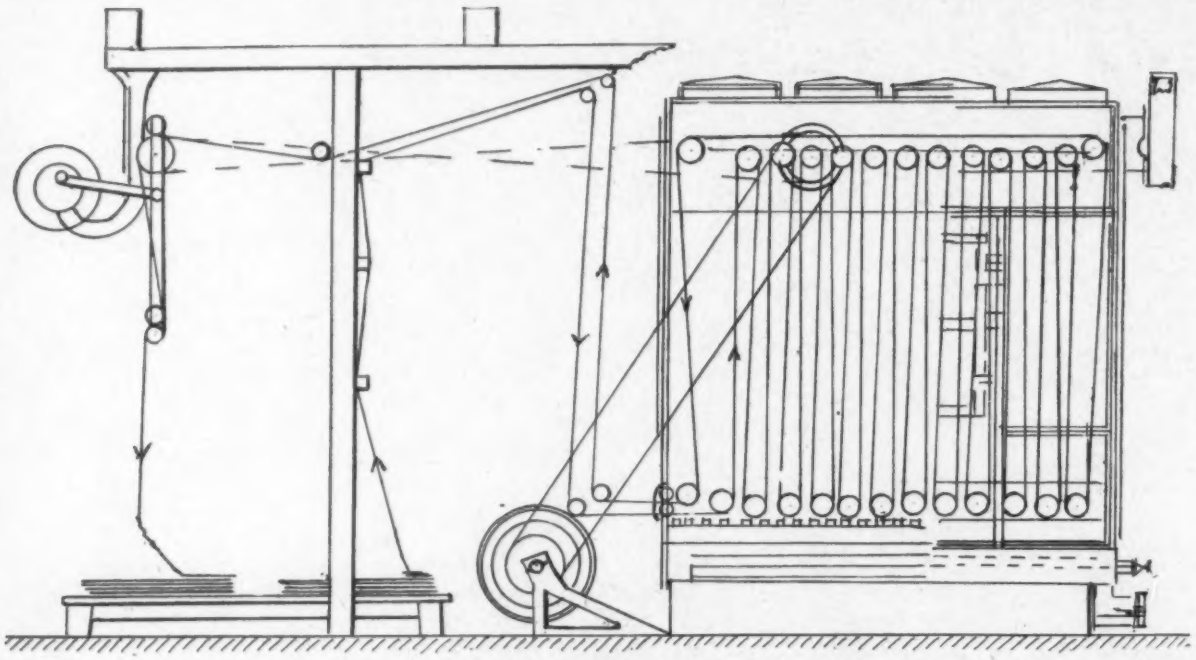


FIG. 2. A TYPE OF AGER.

order to prevent any undue strain on the cloth, every alternate one is driven. The roof of the chamber is formed of steam heated cast iron chests by means of which condensation and the falling of drops of water on the cloth is avoided.

Perforated steam pipes are provided both near the top and the bottom of the chamber for the purpose of supplying the requisite amount of moisture to the ageing chamber. A closed coil of steam pipes, for heating purposes, is placed near the bottom of the chamber. Doors are provided on the side of the chamber for the convenience of threading up, and a wet and dry bulb thermometer is arranged in a convenient position.

A ventilator is provided at the back end of the chamber for carrying away the vapors formed. The cloth passes through the ager at a speed of from 50 to 80 yards per minute. The power required to drive an ager of this type is from 3 to 4 horse power. It is quite possible to dye aniline black by means of a continuous range of machinery. The cloth passes over the entering rails into the padding machine in which it is impregnated with the aniline solution. It is then squeezed and dried on a vertical drying machine of six cylinders. From here it enters the ageing chamber, and from this it passes to the chroming, washing and drying range.

After leaving the drying range, the dyed cloth is plaited down. The whole range is driven by one electric motor, the power being transmitted to the various machines in the range by means of belts and ropes. The cloth passes through the machine at a speed of about 45 yards per minute. The power required to drive a range like this is about 50 horse power.

(This is a second of a series of articles on this subject. Others will appear in later issues. Editor.)

The "Alibi Hound."

An "alibi hound" is a sort of a pointer. You know a good pointer is a dog that points out hidden game to the hunter. An alibi hound is a human animal that points out a good excuse to someone who is hunting results.

Funny thing, too, an alibi hound often makes more fuss over the good excuses he points out than a good pointer does when he produces the real goods.

Alibi hounds frequently consider themselves good pointers. Sometimes they even go so far as to fool others as well as themselves—but for a short time only. Then the hunter perceives his mistake and there's a "good opening for a bright young man."

Sometimes, also, an alibi hound gets wise to himself—sees that the old-fashioned motto, "produce results, not excuses," is really not so old-fashioned after all, and a good pointer is the result.

An alibi hound is a state of mind. It makes its owner think negatively. Instead of devoting his efforts to thinking up reasons for getting things done, the alibi hound thinks up excellent excuses for not getting them done—and then calls it a good job!

Am I an alibi hound? Someone is bound to ask us that. We don't know. Maybe so; maybe no! You may bet your last cent on this though—If you are you know it!

When dealing with yourself let this be your motto, "Treat 'em Rough." Be a regular "devil-dog." And don't compromise with anything—insist upon top-notch results.

The curse of any man, any nation, any world is that great American pastime—"Passing the Buck." It has more followers and less leaders than all other national sports combined.

Alibi hounds always make the "All-American Buck Passers" team.—*The Center Punch.*

Georgia Manufacturers Meet at Macon

Macon manufacturers acted as hosts at the fifth annual convention of the Georgia Manufacturers' Association which was held at the Hotel Dempsey in Macon, Ga., on April 14 and 15. Nearly two hundred manufacturers were present from all parts of the state to listen to the very excellent addresses which the program provided.

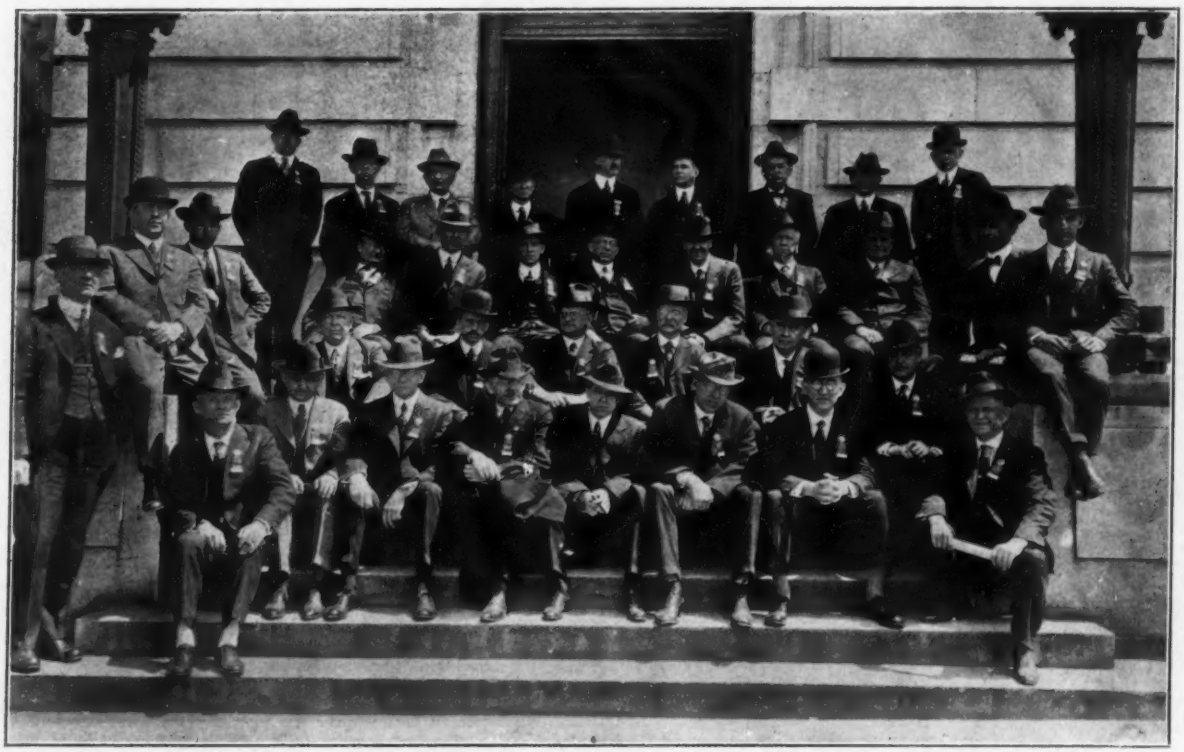
The opening session was called to order shortly after ten o'clock on Wednesday morning and after the invocation and the address of welcome with its response, President Thos. K. Glenn presented his annual address. As this was his final address as president after four years of service in that office his remarks were received with profound interest by the members present.

President Glenn spoke in part as follows:

I think it will be well, at the beginning of this meeting, to review briefly the five years during which your association has been in existence. On February 10, 1916, the first annual meeting of your association was held in Atlanta. On February 14, 1917, the second annual meeting was held in Savannah. On April 10, 1918, the third annual meeting was held in Augusta. On May 14, 1919, the fourth annual meeting was held in Columbus, and today we are holding the fifth annual meeting in Macon.

At the first meeting in Atlanta we had a membership of 87, and had collected dues to the amount of $5,160. Today the report of your secretary will show that we have 266 members, an increase of over 200 per cent, and have collected $11,387, an increase of about 120 per cent. This, in my opinion, is not nearly so good a showing as we should have made, yet I do not think that the number of members that we have, or the amount of money that we have collected is in any way a measure of what has been accomplished. Possibly the greatest good has come from the mingling together of the manufacturers of the state in friendly intercourse, finding out one another's viewpoints and troubles, and in trying to work out, in hearty cooperation, the many problems with which we have had to deal.

The results that have been obtained speak for themselves. Your association has been and will continue to be a powerful influence in furthering the industrial activity of your state, and just here I want to congratulate you upon the hearty support you have accorded to it, and to earnestly urge that you put forth greater efforts in the future. It is entirely in your power to bring to pass results for good not yet dreamed of.



A Small Group of the Delegates. The Picture was Made Just Before Luncheon and the Majority were too Hungry to have a Picture Made. This Also Explains the Strained Expression on the Faces of Those Present. They were Wondering if There Would Be Any Food Left.

It is not my purpose to burden you with a long statement, but I do wish to call your attention to two or three matters which seem to me to be appropriate to mention at this time.

We are passing from a war-time to a peace-time basis, and I cannot help but believe that the responsibility on us as manufacturers is as great or greater than during the time that we were lending our efforts towards winning the fight against Germany. It is true that Germany has been

whipped, but are we not now face to face with just as great a menace? Bolshevism and all of the kindred ills by whatever names they may be called. This radicalism seems to be spreading all over the face of the globe, and it is not beyond reason to expect that we will have it here, more or less. Just to what extent will depend upon the attitude of industry generally.

Labor, and especially colored labor, is becoming scarcer and more difficult to handle every day. This, in a large measure, is due to the fact that during the past five years not only have there been no immigrants coming to the United States, but many who came here in former years have gone back to the old countries, consequently our man power in the South has been and is continuing to be drawn on by other states in the East and Middle West, to take the place of these foreigners. This, together with increased

RETIRING PRESIDENT THOS. K. GLENN.

industrial activities, and the decreased production per man, has caused a shortage in labor, which it seems will not be overcome for some time. What the solution of this is, I do not know, but I do know that it is one of serious concern to us all, for the horrible unrest that prevails all over the country, and the shifting of labor from one locality to another places a great burden on the employer as well as the employee. The labor turn-over in all sections is enormous.

Railroads, unless built up to the greatest efficiency, cannot contribute their share to the industrial welfare of your State. We are right now suffering from a lack of adequate transportation facilities, that seem to be getting worse all the time. Are we doing all that we should to help the railroads in their difficulties? Speaking generally I do not believe that manufacturers in the past have evidenced the helpful disposition toward the railroads that they should have shown, in consequence of which there has grown up a feeling of indifference, if not distrust, between them. It is time that this feeling should be gotten rid of, and the two should go hand in hand with the work that is common to them both.

Your secretary, members of the board of directors, and others, have given much time and attention to legislative matters, both State and National, which I know has resulted in much good. In our State, I believe that a very much better state of feeling exists between manufacturing interests and other interests than has heretofore been the case. We are right now negotiating in a friendly way with labor leaders for the promotion of a workman's compensation bill which will be satisfactory to both parties, and will have their unanimous support. This is merely typical of the attitude of the association. Its efforts have been along constructive lines, and wherever it could foster good legislation desired by others, it has unhesitatingly done so. It does not want to be placed purely in a negative position. I sincerely hope that work will continue along these lines.

In the early part of this year, your secretary suggested the advisability of having a number of the manufacturers of the State go to Washington and have a conference with our Senators and Congressmen there. All of this with the view of getting better acquainted with them, and bringing before them our needs. I think that many of the ills that have come to us in the past by reason of faulty legislation have been due to the fact that our interests were not as diligent as they should have been in bringing before their Congressmen and Senators all of the facts in the case. We have been content to stand aside and criticise, rather than make an effort to have our views presented prior to the enactment of legislation. About forty representative manufacturers met both of our Senators and eight of the twelve Congressmen at a dinner, and had a most delightful occasion. There were talks by various members of the party, and all of the Members of Congress responded. They seemed to appreciate the visit, and I am sure that it will result in good. If we can make two of these trips a year, I think it would be most helpful.

During the year we have been trying to secure closer cooperation between the many industrial associations throughout the State, and with this end in view, during the summer called a meeting of the presidents and secretaries of these associations. A permanent organization was formed, and I hope that much good can be gotten from this.

There are other subjects about which we are vitally concerned, but your secretary has spent a good deal of time in having these subjects presented to you in special papers, by persons competent to speak on them. These will soon be read, and I ask your earnest consideration of them.

In conclusion, I want to thank the officers and members of the association for the help that they have been to me in discharging the duties of my office, and to say that I sincerely regret that I could not have been of more benefit to the association. My whole heart is in the work, and the acquaintances that I have formed during my four years connected with it are very dear to me.

Following the president's address came the reports of the secretary and treasurer and the appointment of committees on nomination and resolutions.

The first address on the program was entitled "Safety First and First Aid" by T. L. Lombard, director of the Department of Military Relief, American Red Cross, Atlanta. Mr. Lombard directed his remarks largely to the application of safety first and first aid in industrial plants and so aroused the interest of the manufacturers present

that before the session was over at least one of them had arranged to have a new building which he had just completed at his mill arranged and equipped for first aid purposes. At the conclusion of Mr. Lombard's remarks Capt. H. P. Meikleham of the Massachusetts Cotton Mills, at Lindale, Ga., spoke briefly outlining the very successful experience he has achieved with his first aid equipment and trained nurse.

The concluding speaker at the morning session was John A. Betjeman of Columbus, Ga., who discussed "Things As Seen and Heard in Washington." Mr. Betjeman discussed the work of several departments and bureaus and strongly advocated the cooperation of the manufacturers in urging a larger appropriation for the use of the Bureau of Foreign and Domestic Commerce, the appropriation for the ensuing year having been materially cut down by members of the House during the discussion on this appropriation bill. Mr. Betjeman also strongly urged the cooperation of manufacturers with their Senators and Congressmen in telling them exactly what they wanted. He pointed out that the labor unions of the country maintain the best pleaders at their disposal to urge their wishes and desires and it was but natural, he continued, for Congressmen to act along the lines where the most interest seemed to be indicated by their constituency.

After recessing for luncheon the convention reassembled at 2:30 o'clock. J. E. Edgerton, president of the Tennessee Manufacturers Association, who was on the program for the first address, was unable to be present but he very thoughtfully sent Dr. Gus W. Dyer, of the Department of Economics of Vanderbilt University at Nashville, to take his place. Dr. Dyer presented an A B C talk in economics and urged the necessity of getting back to first principles in the government of the country. He denounced socialism and the many socialistic and bolshevistic tendencies of the present day and urged the re-adoption of the strong rugged democratic prineiples of our forefathers.

The second address in the afternoon session was by B. F. Harris, president of the First National Bank of Champaign, Ill., who spoke to the subject "Americanism the Cure." Mr. Harris' address followed the same general lines of his previous address before the joint convention of the National and American Cotton Manufacturers' Associations in New York in 1918 his ideas and opinions being fairly familiar to the cotton manufacturer readers of COTTON.

The last address at the afternoon session was on "Combination and Industrial Progress" by James A. Emery, general counsel for the National Association of Manufacturers. Mr. Emery outlined the difference existing between one man quitting his job as an individual and two or more men quitting their respective jobs after a preconsidered arrangement and in a body. He pointed out that the "right to strike" was not included in the Constitution of the United States despite the claims of numerous labor leaders and their sympathizers to the contrary. Mr. Emery's remarks are always interesting and very much to the point and were listened to with rapt attention by the delegates present.

At 8 o'clock in the evening all delegates and guests attended a banquet on the mezzanine floor of the Dempsey Hotel as the guests of the Macon manufacturers. General Walter A. Harris officiated as toastmaster and called upon numerous members and visitors for after-dinner talks. One of the happy events of the evening was a brief presentation speech by Chairman A. D. Schofield of the local entertainment committee in which he conveyed the good wishes of the association members to retiring President Thos. K. Glenn as he presented him with a very handsome silver water service. At the conclusion of a very enjoyable evening the members dispersed to reassemble on Thursday morning.

The Thursday morning session was called to order at about 10:30 o'clock the first address being by John Calder, manager of industrial relations for Swift & Co., Chicago. Mr. Calder was unable to be present in person but he sent a prepared address on "Educating for Industrial Cooperation", describing the methods adopted by Swift & Co. for their many plants, which was read by Dr. J. P. Staf-

W. B. BAKER, NEWLY ELECTED PRESIDENT.

ford of Swift & Co., who was present at the request of Mr. Calder.

A brief talk was made by an officer from Camp Gordon, near Atlanta, outlining the practical methods now adopted for vocational education in the army. He concluded by inviting interested Georgia manufacturers to visit Camp Gordon at their convenience and look over the arrangements which had been made by the government for conducting this work at that point.

Another address which was scheduled on the program was on "The Human Factor in Industry" by C. R. Towson, of the industrial department, international committee, Y. M. C. A. of New York. However, owing to the railroad strike Mr. Towson wired he was unable to get out of New York for Macon in time for the convention.

The next address on the program was a discussion of

the proposed workmen's compensation act which had been agreed upon by committees representing the manufacturers of Georgia and the labor associations of Georgia and which is to be brought before the next general assembly. This discussion was by Robert S. Parker of Atlanta, counsel for the association, who discussed the salient points of the bill paragraph by paragraph and at considerable length.

At this point on the program time was allowed President Charles Adamson of the Cedartown Cotton & Export Company, who made a plea for funds for Agnes Scott College. He outlined the necessity for immediate action in this matter and urged that manufacturers present give the matter careful consideration and adopt individual action to take care of the comparatively small sum still remaining to be raised. At the conclusion of his remarks Mr. Adamson turned over a personal contribution of $1,000 to the secretary to be forwarded in the name of the association and suggested that the other individual members interested in this proposition take similar action at their convenience.

Next came the reports of the standing committees followed by the election of officers. The new officers are as follows:

For President; W. B. Baker, president of the Atlantic Ice and Coal Corporation, Atlanta.

For Vice-Presidents: A. D. Schofield, vice-president of J. S. Schofield's Sons Co., Macon; W. J. Pierpont, vice-president Pierpont Manufacturing Co., Savannah; and W. J. Vereen, vice-president, Moultrie Cotton Mills, Moultrie.

Final adjournment was then taken.

The afternoon of Thursday was given over to entertainment. The manufacturers of Macon once more became the hosts of their visitors and at the conclusion of the final session automobiles were in readiness in front of the hotel to carry the guests to the Country Club where a real Georgia barbecue was served on the wide verandas of the club house. At the conclusion of the barbecue some of the delegates remained at the club to play golf while others became guests of individual Macon manufacturers and motored around the city visiting points of interest. Taken as a whole it was a most interesting and successful occasion.

Among the resolutions adopted by the Convention were the following:

Whereas, there is a movement under way in several of our cities to force a "closed shop," and

Whereas, we recognize the right of citizens of the United States to organize for the promotion of their views and the improvement of their conditions, and

Whereas, this right long exercised and enjoyed is now being used unjustly and oppressively for the accomplishment of aims and objects repugnent to free institutions and good citizenship, therefore be it

Resolved, that the Georgia Manufacturers' Association in convention assembled declares that the "closed shop" is a denial of the right of a citizen to work for whom he pleases and restricts his rights to liberty and the pursuit of happiness ,and be it further

Resolved, that we declare for the "open shop" in Georgia and shall use all just and fair means to maintain the right of any citizen of our State to earn an honest living without restriction or compulsion from any person or organization.

Whereas, one of the big reasons for the present high cost of living is because of the federal excess profits tax, and

Whereas, the extravagant expenditures by our national government can be curtailed under a business administration so as to reduce all federal taxes, therefore be it

Resolved, that we urge our senators and representatives in Congress to use their influence to eliminate the excess profits provisions of the federal tax laws, and to further use their best endeavors to stop the extravagant expenditures in the maintenance of bureaus and commissions in Washington, and further that any deficiency caused by tax law revision be made up by a suitable protective tariff.

Whereas, Mr. Thomas K. Glenn has for the past four years discharged the important duties appertaining to the office of President of this Association with signal ability and success, and

Whereas, he has at this time refused to permit his re-election, and

Whereas, it is the desire of the members of the Association that some permanent record of appreciation be placed on the minutes,

Therefore be it Resolved—First, that in his capacity as President, Mr. Glenn has rendered invaluable service to the Association; second, that the sincere thanks of all members be extended to Mr. Glenn for his untiring and unselfish work; and third, that these resolutions be spread upon the minutes as a part of our permanent records.

Whereas, the Advertising Club of Atlanta is undertaking a campaign to secure the 1921 convention of the Associated Advertising Clubs of the World, and

Whereas, the City of Atlanta has, by its experience in entertaining conventions, brought to the state of Georgia a great many people from the various sections of America, and

Whereas, the Associated Advertising Clubs of the World when in convention assembled, brings together from every section of America and other countries, men of intelligence and great constructive ability in business,

Therefore be it Resolved that the Georgia Manufacturers' Association, in convention assembled, at Macon, Georgia, this 15th day of April, 1920, commend the Advertising Club of Atlanta for their efforts to obtain this convention for Atlanta, and enjoin with them in extending to the Associated Advertising Clubs of the World, a hearty and sincere invitation to come to Georgia in 1921.

STATEMENT

of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, of COTTON, published monthly at Atlanta and Dalton, Ga., for April 1, 1920.

State of Georgia, County of Fulton, s. s.

Before me, a Notary Public, in and for the State and county aforesaid personally appeared O. A. Sharpless, who, having been duly sworn according to law, deposes and says that he is the Treasurer of COTTON, and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 443, Postal Laws and Regulations, printed on the reverse side of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, W. R. C. Smith Publishing Co., Atlanta, Ga.; Editor, L. L. Arnold, Atlanta, Ga.; Business Manager W. J. Rooke, Atlanta, Ga.

2. That the owners are: W. R. C. Smith, Atlanta, Ga., W. S. Cushion, Cleveland, O.; O. A. Sharpless, Atlanta, Ga.; J. C. Martin, Atlanta, Ga.; H. H. Kelley, Atlanta, Ga.; W. J. Rooke, Atlanta, Ga.; L. L. Arnold, Atlanta, Ga.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or any other security holders are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. O. A. SHARPLESS, Treas.

Sworn to and subscribed before me this 1st day of April, 1920.

(Seal) E. L. PHILPOT,
Notary Public.

(My Commission expires February 23, 1923.)

Cotton Manufacturers Meet at Boston

BY C. G. FOWLER.

A national, if not international, note was struck by President W. Frank Shove of the National Association of Cotton Manufacturers at the opening session of the annual spring meeting at the Copley Plaza Hotel, Boston, on Wednesday evening, April 21. He issued a warning against the time when either the present shortage of labor must be increased from within or workers be induced to come to this country from abroad. Also he emphasized production on a great scale as the one essential to bringing down the cost of living, a thing which is as true of Great Britain and other countries as of America.

This was one of the features of the opening of the three-day convention. Following the president's address, reports were made by Secretary Rufus R. Wilson and Treasurer W. Irving Bullard. A guest of the Association, Charles F. Weed, president of the First National Bank of Boston, was another speaker. Mr. Weed took for his subject the outlook for America in one of the foremost markets for cotton goods in the world, "China." He spoke from the observations of a seven-months' trip that he made through the Orient last year, on "Our Stake in the Pacific." He designated this stake as China and pointed out the wonderful market for American goods which he believes is to be developed there. His address appears on another page.

Following this business session, the meeting was turned into one for good fellowship and getting acquainted. A "pop" concert was held as a starter of the social festivities which share with the business sessions the annual gatherings of the cotton men in this city.

Early Thursday morning the convention came to order for the first business session of the day. Five formal addresses were made during the forenoon, besides which an informal discussion was led by Dr. Charles W. Eliot, president emeritus of Harvard. Good will in industry was emphasized as the element which must be invoked eventually to establish normal conditions between employers and employees. James Thomson acted as chairman of the meeting. In his introductory address, he connected the idea of good will with the continuity of employment which, in turn, depends upon proper planning for adequate production of goods.

Chairman Thomson spoke substantially as follows: "In April, 1919, at a discussion during the National Association of Cotton Manufacturers' meeting held at the Biltmore Hotel in New York City, I took advantage of the occasion to offer for consideration the necessity of continuity of employment to the employee. Since then, of course, there has been no dearth of opportunity for any man, woman, or minor, of legal age, to find continuous and profitable employment. This was due to the still existing excess of demand over supply. Unless the unexpected happens, it is likely that this condition will prevail for some years.

"The void, or 'hole,' in the supply of all commodities, caused by the war, with its consequent cessation of production, and excessive consumption of commodities due to the requirements of the Army, and the destruction, must be filled up before supply will commence to satisfy demand. So I think that we have but little fear that opportunity for continuous employment will not be afforded. Just what advantage the working class will take of this opportunity must necessarily remain to be seen. My concern, therefore, is for the opportunity for continuous employment after supply satisfies demand, and the 'hole' mentioned has been filled up. Then gradually supply may exceed demand and all matters will take on a more normal aspect. Market conditions will regulate prices; prices will regulate wages; wages will regulate purchasing power.

"What will happen then as to assured continuity of employment? An answer to this question is premature at this time, though the question is none the less pertinent. However, I recommend, and urge, employers, whether they be manufacturers or otherwise, to look ahead and so build that the very foundation of industrial good will, which in my opinion is assured continuity of employment, may be safeguarded.

"Let us be protected at that time against an influx of cheap goods from other countries, in a proper way. Let us, meanwhile, so develop our markets that, when supply in this country has met its demand, we may have more and larger outlets for our production. Let us study, meanwhile, how by improved machinery, improved methods of its manipulation and, above all, the establishment of industrial good will, we may be ready to meet the changed conditions and be fully prepared with cash, courage and confidence, to assure for the worker the *sine qua non* of his existence and happiness—'continuity of employment.'"

Confidence was the keynote of the address of Dudley R. Kennedy of Philadelphia, a man who has worked at all stages from that of a common laborer at $1.25 a day of ten to twelve hours to the management of industry. His remarks were provocative of generous cheering by the cotton men. Today there is no confidence between capital and labor, he said, such as existed when the superintendent and workmen were in closer acquaintance and fellowship. The growth of manufacturing units in the past ten to twenty years are the cause of the loss of such confidence, he declared, the managements being to blame for the new conditions.

Mr. Kennedy deprecated the reference to labor as "hands" and the reservation unto themselves by manufacturers of the right to do all the thinking for their industry. Asking the question, "Why are all these demands from labor?," he answered by declaring that it is because the managements have been too busy to instruct the workers in fundamentals. While they have considered the workers as mere "hands," outsiders have poured into their ears and minds insidious information. "If you don't know what the workers are thinking about, it is high time that you found out," he said. "I am chagrined to find that many of the manufacturers themselves do not know the fundamentals of business economics."

"In meetings of this kind," continued Mr. Kennedy,

"it does no good to damn the agitator; he believes what he is agitating. Workers really think that there is an inexhaustible supply of gold in the safe in the front office. They don't really know where the money comes from that goes into their pay envelopes. They don't know how business is done or that 95 per cent of all manufacturing corporations in the country are struggling to make six per cent on their investment; because they read all the time about the other four or five per cent who are making big profits."

Radical propaganda in this country was brought into the address of Mr. Kennedy, who said that the Government is fiddling around with the deportation of a few Reds while the country is at least smoldering. "What we want is the hardest thing in the world to put over. It is education of the workers. The day of secrecy about inner workings of your business is gone by. What happens when a man comes from a radical meeting to your shop in the morning and asks the foreman a fundamental question about your business? The time is right then and there to nail the lies that he has heard at the meeting by giving the real information, but in 99 and nine-tenths per cent of the cases the foreman cannot tell because you have been too busy with what you thought were bigger things to tell your foreman about your business. It is my opinion that the managements have passed the buck long enough."

Mr. Kennedy made the point that the workman has six hours in the day for recreation or to spend in the radical meetings, listening to lies about employers. The employers have him two hours longer than the agitators and can teach him the truth. "You call him a 'hand' in the day time," he said, "but don't forget that he is using his noodle in the night time and not always for your benefit. You can sit in your mahogany chair and think up the most beautiful theories, but if your foreman does not carry them out in spirit you are merely kidding yourself. The foreman is the man who has to put over the confidence in the heart of the workingman, but he may be thinking more and more in the terms of the workers."

In closing, Mr. Kennedy declared that the workers must be made to understand that all are now in the inexorable law of supply and demand. The only way that the manufacturers can get production is to lead out the workers, not to drive it out of them. "We have got to either sweat or die. If we cannot do the job in eight hours we must go to nine or ten hours, but the workers must be educated so that they can see it."

Other addresses of the session, under the general heading of "The Way to Industrial Goodwill" were made as follows: Boyd Fisher, Detroit, on "Collective Bargaining as a Basis of Efficiency;" Mrs. Ethel Thomas, LaGrange, Ga., on "Welfare Work in Southern Mills;" Sherman Rogers, New York, on "Direct Action versus Inaction," and Edward E. Rice, Boston, on "Group Insurance for the Industrial Worker."

On Thursday afternoon another business session was held, with a group discussion on "The Growing and Handling of Cotton." Albert Greene Duncan, chairman, opened the meeting with a few informal remarks. Addresses then were given by H. M. Cottrell, of Little Rock; Albert L. Scott, of Boston; D. S. Murph, of the Department of Agriculture; W. H. Knox, of Phoenix, Ariz., and others. These were followed by a discussion of recommendations made by a special committee of the National Council of American Cotton Manufacturers and the American Cotton Manufacturers' Association.

A point made by Mr. Cottrell on Thursday afternoon is worthy of stressing, viz., that the value of the cotton crop could be increased to the enormous extent of $1,000,000,000 annually through the cooperation of the manufacturers. He said that a better quality of product for the spinners would result from strong, friendly, helpful work on the part of the National Association.

The first thing on the program for the final day, which was also the fullest day on the program, winding up with the banquet, was the presentation of the association medal and a special medal. The presentation was made by Peter Corr, chairman of the Medal Committee, and Rufus R. Wilson, secretary of the association, was the recipient. W. Frank Shove, the retiring president, was given the special medal.

In presenting the former medal, Mr. Corr said: "Your committee, after considering carefully all the papers presented at the meetings of the past year, many of which we found very excellent, finally decided unanimously that the work done by your secretary deserved our utmost recognition. We therefore award the association medal to Rufus Rockwell Wilson for the conception and organization of the World Cotton Conference.

In presenting the second medal, Mr. Corr said: "Your committee were also unanimous in the opinion that, under the existing circumstances, a special medal should be awarded to one who has put his every energy into the upbuilding of the association. We therefore have awarded a special medal to the retiring president, W. Frank Shove, for the conscientious and efficient service as president covering the period of the World War."

Responding, Mr. Shove said: "Mr. Chairman and gentlemen: I was certainly very much surprised when I heard that the medal committe had awarded a medal to the president and am still surprised, because I did not realize that I had done anything to merit such an award. If there has been any good work done in the association, and I know there has been good work—if members have been benefited by the work of the association, and I know they have—the honor should not go to the president, but to the secretary and members of the board of government, the members of the different committees, who have all labored to make the work of the Association a success in the past two years. I do not think I ever was associated with a body of men where I received such cooperation as I have in the National Association in the past two years.

"Everyone has responded to anything that he has been asked to do. The committee meetings have been well attended. Committees composed of ten or twelve members would have eight or ten present at every meeting. I appreciate this gift, not perhaps for the intrinsic value, but the thought of the good fellowship and cooperation which the members have given me during the past two years. And all that I can ask of you today is that you give to the incoming president the same hearty cooperation and good fellowship which you have extended to me."

This annual ceremony was a preliminary to the fourth session and the third group discussion. The object of this

session was "Problems of Mill and Counting Room," it being introduced by Charles T. Plunkett as chairman. The session brought forth such points as the need of dropping the antiquated buying of cotton by gross weight, paying thereby the same for tare as for the pure fiber; also the progressiveness in mill construction, oil for power, and electrification; even various phases of insurance and the matter of broad publicity.

James R. MacColl, Pawtucket, took up the subject of "Buying Cotton Net Weight." James E. Sirrine, Greenville, S. C., talked on "Recent Changes in Mill Construction." The other addresses of the session were "Cost Accounting in the Textile Industry," Charles R. Stevenson, New York; 'The Substitution of Oil for Coal as Fuel," Frank M. Ashley; "Mutual Liability Insurance Service, " William M. Burch, Boston; "The Ethics of Insurance," Fred. S. Smith, and "Publicity as an Aid to the Textile Industry," A. A. Talmage, New Bedford. An open forum followed.

Following the discussion on "Recent Changes in Mill Construction," Kenneth Moller, of Lockwood, Greene & Company, Boston, said:

"Mr. Chairman, I think it would be very interesting to hear some of these men express some opinion about rigidity in cotton mills, because while I feel very, very strongly about the subject of reinforced concrete mills, which I think is the only type of structure to put up if we can, I have heard the opinion expressed by one or two men that a mill could be too rigid for the proper operation of cotton machinery. Now, I have not felt myself that that was so, but if there are any advocates of that idea I think it would be extremely interesting to hear them."

Chairman Plunkett: There is a difference of opinion about that, and I hope we may hear it expressed here. Is it possible to have a floor surface too rigid?

Mr. Hartshorne: Mr. Chairman, may I say a word? I think it is quite possible in some classes of machinery, but there is no difficulty in cushioning such machinery, so that would be taken care of.

Another business session with addresses was held on Friday afternoon. In this the subjects taken up were as follows: "The Need for Original Design in American Textiles," James F. Turner, New York; "Functions of the Textile School," W. H. Dooley, New York; "The Economics of Research in the Textile Industry," Harrison E. Howe, Washington; "The Export Trade Situation as Regards Cotton Goods."

Dividing interest with these meetings of Friday and the association banquet in the evening was the business session which included the election of officers and the passing of resolutions. Russell B. Lowe of Fitchburg, Mass., was chosen president, advancing from the vice-presidency to the head of the organization. Mr. Lowe is president of the Parkhill Manufacturing Company in Fitchburg, owner of the Fitchburg Garment Company, treasurer of Sprague, Lowe & Grout Company of Orange, Mass., and a director of the Fitchburg Bank & Trust Company. He also has connections with several other concerns.

Other officers elected were: Senior vice-president, James Thomson of New Bedford, Mass.; junior vice-president, Robert Amory, Boston; directors, Nathan Durfee, Fall River; Charles M. Holmes, New Bedford; John E. Rousmaniere, New York City; Samuel Stewart, Lewistown, Me.; E. Kent Swift, Whitinsville, Mass.

Upward of 500 men attended the banquet, on Friday night, this ending the festivities and the convention. The newly-elected president, Mr. Lowe, was toastmaster. Previous to the speech-making, while the dinner was being served, a lusty band was demonstrating perpetual motion with a riot of music. A bit of fun was injected when Stephen C. Lowe, of New Bedford, usurped the position of the bandmaster and led the players through a stirring rendering of one of Sousa's marches.

Speaking on "The Business Outlook," Willis H. Booth, vice-president of the Guaranty Trust Company of New York, said in part: "The Far East—Asia— with its population of a billion, represents the greatest market for cotton in the world, a market in which Great Britain has been

SECRETARY RUFUS R. WILSON AT LEFT AND RETIRING PRESIDENT W. FRANK SHOVE AT RIGHT. THE TWO MEDAL WINNERS OF THE CONVENTION.

the domina ing factor, with Germany the next largest foreign purveyor, before the war. Here we find a great shortage of cottons due to the war. German mills have not produced for the Eastern trade and Lancashire mills have sent much less than normal amounts of cotton goods to Asia.

"During 1919, for example, the volume of Indian imports of cotton manufacturers from Great Britain was only a quarter of the total for 1913. Native mills, including Japanese, have done not a little to supply the deficiency, and in Japan particularly there has been a remarkable increase in the export trade of cotton goods to other parts of the Orient. Inability to secure from the Occident mill machinery and other equipment in sufficient amount was apparently the chief reason why Oriental output of cotton was not even greater than it was.

"The Orient wants and has the power to command vast quantities of cotton goods in the near future. During the present year, the importations of cotton goods into India and China will probably be worth not far from a half million dollars. How far will these wants be supplied? It may well be expected that not merely a growth in their mill equipment, replacing home manufacture, but larger crops in response to higher prices will enable the Orient to meet an increasing ratio of its own wants.

"India has just harvested a crop of 5,800,000 bales of 400 pounds each, one of the largest in her history, a crop not far from half as large as our own present crop. China holds her own as the third largest producer of cotton among the nations of the world, with a crop of roundly 4,000,000 bales. In neither of these countries, however, can it be expected that either larger crops or increased home manufacture will seriously affect the volume of purchases from abroad.

"There are those who look to a land further West for the next important increase in the world's supply of raw cotton. I refer, of course, to Mesopotamia, where, as we know, the Germans, before the war, had hoped to build up a cotton empire to meet the growing needs of her textile industry and make her independent of American and English sources. The British, since their occupation of the country, have made interesting experiments which seem to have proved the practicability and feasibility of cotton cultivation on a large scale. Apparently Mesopotamia is capable of producing a fairly long staple, comparable with a good quality of American upland, and with a cheap labor supply may in the course of the next decade become a formidable competitor of our own South in the markets of the world.

"Just at this time, too, we learn that the Argentine is preparing to ship some cotton to Liverpool in the hope that it may begin to establish at the great British center a market for that fiber, as it has at Bradford for its wools. There is no land that would not be glad to take advantage of the present unwillingness or inability of the South to sow acreage that will produce crops of more than 11 or 12 million bales in spite of the crying need of the whole world for the precious fabric, cotton. And above all, Great Britain, just as during and after our civil war, is more than eager to assure herself of a steady supply of cotton, irrespective of what happens in the United States. The South, rightly enough, has come to the decision not to put all its eggs into the one basket, the cotton crop, and Great Britain, with equal wisdom, would fain not buy all its eggs in the one market.

"Statistics, interesting in this connection, have just been published, for foreign trade during March, which reveal the astounding fact that during that month the value of our exports, in the face of extraordinary discounts on foreign exchanges, amounted to no less than $820,000,000. To this imposing total, surpassed only last June, raw cotton undoubtedly contributed the largest single amount for any one commodity. The total exports of cotton for the nine months of the present fiscal year have certainly been worth more than $1,100,000,000, a figure nearly equal to the total value of all our exports for the whole year, 1898. Of this, Great Britain has purchased more than $600,000,000 worth of the fiber, with France, Japan, and Italy taking roughly $100,000,000 worth apiece.

"It is difficult to generalize on the subject of cotton developments or almost anything else in a situation such as obtains today all over the world. Not within the memory of the present generation has the world been in such unstable equilibrium as it is at this very moment.

"If we had only done for the Philippine Islands what we should have done. If the vision of your own Cameron Forbes had been supported by the United States Government, there would be an outlet for your surplus goods that would be the most satisfactory of any in the world. It is a great misfortune that his vision was not supported."

Two speakers at the banquet stressed the importance of the dye industry, an independent American dye industry, to the safety of the future of this country. These men were Joseph H. Choate, Jr., a member of the New York bar, and Lt.-Col. Amos A. Fries, chief of the Bureau of Chemical Warfare of the Army. The latter saw the gas warfare from its inception and said that it is the most humane manner of fighting.

Mr. Choate said that the textile manufacturers owe something to the dye trade, which spent millions to do what the Germans said was an impossibility. Thereby they made the textile business of the United States independent. Thus it is to the self interest of business to support the new dye industry. He said that the Allies had knocked the tar out of Germany, but that to keep the forces of civilization continuously on top, it was necessary also to knock the coal tar out of Germany.

Lt.-Col. Fries showed the tremendous cost of the unpreparedness to the Allies in the chemical warfare, due to the lack of independence in dyes. He recounted how the development of the nitrate industry through chemical research had saved Germany from early defeat in the war. He said that this country would not be worth ten cents in the future if not independent in the dye industry, because this is the basis of war supplies in poisonous gases and other chemical needs of the Army. And chemical warfare is going to stay.

Rev. Joseph Fort Newton of New York, pastor of the City Temple of London during the war, spoke on "The Future of the Anglo-Saxon Races." He said that therein lies the future of civilization. Percy R. Todd, president of the Bangor & Aroostook railroad and regional director for the Government in New England during Government control, told of the critical situation which faces the railroads of the country. He told the manufacturers how they could come to the support of the railroads in this crisis.

Following are the resolutions passed at the Convention:

The National Association of Cotton Manufacturers voices the unanimous sentiment of the American people that peace should be consummated without further delay.

We believe that the United States should give unmistakable assurance, compatable with the Constitution, to the nations allied with us in the great struggle for world liberty that we will stand again as we stood in the past with all our resources of men and money for the preservation of civilization, for the maintenance of world liberty and for the security of the rights of humanity on land and sea.

As we bore our part in the terrible fighting that brought victory to the allied armies we should bear our part in the peaceful ministrations needed throughout a stricken world.

Only an industrious nation can be a contented and prosperous one, and we welcome the revival of industry in nations torn and devastated by the ravages of war. This has been a fit and proper time for international cooperation; but as the nations recover the full measure of their industrial strength there will again come international competition.

(*Continued on page 480.*)

The Substitution of Fuel Oil for Coal

BY FRANK M. ASHLEY.

In studying the great advances made in the methods of burning coal as a fuel and the changes in prices that have recently occurred, it becomes a matter of great importance to the manufacturer to determine which kind of fuel will best meet his particular requirements. The deciding factors in determining this are: the cost of fuel delivered at the plant, the reliability of the supply, the cost of utilization at the plant, insurance, storage, cost of installations, depreciation, etc., most of which factors are dependent upon the location of the plant, and to the sources of supply.

Oil as a Fuel.

Among the many advantages to be obtained by the use of fuel-oil as against coal are the following:

Higher efficiency, due to more perfect combustion with less excess air, and, therefore, less heat lost up the stack. A more equal distribution of heat in the combustion chamber, as the fire doors do not have to be opened. More heat absorbed due to the clean condition of the tubes.

No cleaning of fires necessary; which enables the boilers to be operated at their maximum capacity continuously.

A reduction in the cost of handling fuel, as this is done mechanically. No expensive conveying or elevating systems are necessary as fuel-oil is delivered by either pumping or running the oil by gravity into the fuel storage tanks. This not only is an economy in the cost of handling fuel, but also in the first cost of a plant.

A reduced cost of maintenance. No firing tools or grate bars are necessary and accordingly the furnace lining and brick work last longer. The burning out of grate bars in a coal fire, especially when automatic stokers are used, is a constant source of expense, as is also the damage to furnace linings caused by the use of firing tools, and removal of clinkers.

Absence of coal dust, dirt and ashes, which enables the boiler room to be kept clean, and accordingly reduces the wear and tear on pumps and other machinery; also the cost of handling and removing ashes is entirely eliminated.

Ease with which fires can be regulated from a low to a most intense heat in a short time. The use of fuel oil enables the engineer to leave his plant standing to within a short time before the boilers have to be cut in on the line. The burners are then lit and in a few minutes the boiler will be at full working pressure. Fluctuation in boiler loads can be taken care of on a moment's notice by simply turning the oil and steam valve, and as soon as the demand ceases the fires can be at once turned down to normal or extinguished entirely as occasion demands.

Great saving in labor of all kinds—firemen, coal passers, and ash handlers, as only one fireman is required to operate from ten to fifteen boilers.

Increase in boiler capacity depending on the grade of coal used and the draft conditions. Generally from 10 to 25 per cent increased capacity can be obtained by using fuel oil and as the stack height required for burning oil is less than that required for coal, more power can be developed from the same stack.

Absence of smoke. The increased attention given to smoke laws by the various city ordinances throughout the country has made the producing of smoke in a plant a serious question. In a properly handled oil burning plant smoke is eliminated entirely except in a few cases when the stack will smoke for a short period while the burners are being started up from cold.

In stationary plants oil is usually stored in tanks located below the surface of the ground and is pumped from these storage tanks to the burners located at the front end of the furnace. On the way to the furnace the oil is passed through superheaters under a constant steady pressure from two steam driven pumps provided with a large air chamber to take up the pulsations of the pumps. The superheaters use live steam to heat the oil to the proper temperature, which is about 260 degrees F.

The following is a brochure of the Department of the Interior of the United States by J. M. Wadsworth, 1918:

"Heating the Oil—Viscosity and Flash Point."

"For effective atomization of fuel oil, the viscosity must be reduced by heating. The proper viscosity can be determined experimentally; it ranges from eight to fifteen degrees Engler. Certain oils now marketed have to be heated above their flash-point in order to attain this viscosity, consequently the hazard in handling them is increased. Inflammable vapors driven from the oil at or above the flash point are a continual menace and such heating should be avoided if possible. The purchaser should specify, in contracting for a supply of fuel oil, that the oil will attain proper viscosity at a temperature below the flash-point.

"In practice there is often a tendency to overheat the oils. The capacity of the burner increases as the oil is heated to a certain temperature determined by the viscosity and expansion relation, but with further increases of temperature the capacity steadily decreases. The operator should always know the temperature to which the oil is being heated and govern the conditions according to the oil."

When the oil leaves the spray nozzles or burners under the boiler, it instantly breaks up into the finest atoms. The oil is carefully strained on its way to the burners to remove any matter held in suspension. The combustion air is properly carried to the atomized oil by means of air registers which are so constructed as to cause the air to form an intimate mixture with the oil gasses, thereby securing complete combustion.

There are several different systems in general use comprising automatic means for regulating the amount of oil supplied to the boiler, depending on load conditions. There are also different types of combustion chambers, this depending on the type of boiler used and also other local conditions. The burners are made of different capacities and with interchangeable discharge tips or nozzles ranging from 66 pounds of oil discharged per hour up to 175

*Delivered before the National Association of Cotton Manufacturers.

pounds per hour per nozzle. The burner is used with blast, the pressure of which depends upon the conditions, usually an air pressure of four to six inches water gage is used and one hundred cubic feet of free air per pound of oil.

The quantity of the blast is, as a rule, only intended as a part of the air for combustion. This feature is very desirable as the same size of pipe and same quantity of blast answer for the larger or smaller quantities of oil, while the balance of the air, which is required for combustion, is admitted through the air registers. The location of the burner need not necessarily be fixed on the front of the boiler, as it depends on the form of the furnace and the convenience with which it can be attached and operated. It may be fixed horizontally or at an angle, with the direction of the flame upward or horizontally through the front, through the side walls or through the back. The oil supply to the burner should be under a pressure of not less than sixty pounds, at which pressure a sufficient atomization of the oil is reached.

The amount of water evaporated per pound of oil burned depends on the heat units per pound, ranging from 18,000 B. T. U. to 19,500 B. T. U., and evaporates from 12 to 14½ pounds of water, actual—or from 15.35 to 16.26 of water from and at 212 degrees Fahrenheit, where the combined furnace and boiler efficiency is from 76 to 83 per cent.

Where plants are now using coal with mechanical stokers, etc., an oil equipment can be connected as a supplementary heat generating plant to take care of the overloads; these combined installations have given excellent satisfaction in many cases.

It appears from recent investigation that the use of fuel oil has grown to such proportions that the demand far exceeds the supply and is increasing relatively faster than the supply, consequently the price of oil has increased rapidly, and unless a further supply can be obtained from our fields or from foreign fields, oil will soon be too expensive for use in steam boiler plants on land, since its advantages for fuel are such that the uses for marine purposes will absorb practically all that can be obtained.

In 1917 there was produced in the United States 335,315,601 barrels, forty-two gallons to the barrel, valued at $522,635,213. In 1918 there was produced 353,927,716 barrels, valued at $703,943,961.

In 1918 there was imported into the United States 32,084,360 barrels, practically all of which came from Mexico. From the 1918 total there was exported in crude oil only 3,899,583 barrels. This does not include bunker oil amounting to 5,954,448 barrels.

Most of the United States exports of crude oil go to Cuba and Argentina. Next to the United States in production is Russia, which produced in 1917 69,000,000 barrels of crude petroleum, and Mexico which produced 55,292,770 barrels; Dutch East Indies, 928,955 barrels. It would therefore appear that Mexico is the only country that we could expect to receive oil from for domestic use here.

The bulk of the sources of foreign oil supply is controlled by Great Britain, France and the Netherlands.

The demand of the shipping programme alone will call for oil in quantities equivalent to nearly one-half of the present domestic output.

Mr. Daniels, Secretary of the Navy, recently stated that a serious condition with reference to oil for the ships had arisen and called attention to the fact that the Shipping Board had received offers of only a little more than a million barrels of fuel oil when it had advertised recently for bids on forty million barrels for its ships.

Oil is a natural fuel for ships. Compared with coal it is cheaper, easier to handle and the more efficient. At present, in this country, we are not producing enough oil to meet our own domestic requirements; this means that a smaller amount of oil is available for use on land. Large tank ships carry 75,000 barrels of oil, which is approximately equivalent to 20,000 tons of coal in B. T. Units. Twenty tons of oil is enough to yield 5,000 horse-power for a ten hour day.

Fuel oil was originally used as it came from the wells, but now it is topped for the lighter constituents and the residuum only is used. A barrel of forty-two gallons is standard and weighs about 317 pounds and contains 6,000,000 to 6,200,000 B. T. U. It must be noted that crude petroleum may be divided into two classes, namely, one with a paraffine base, and the other with an asphalt base. Oil with a paraffine base is so valuable for its derivatives, such as gasoline, kerosene, lubricating oils, and many other purposes, that its price is and probably always will be prohibitive for fuel purposes.

In a recent number of a marine periodical a president of a Standard Oil Company certified that Mexico was even now ready to supply yearly 450,000,000 barrels of fuel oil, were there but ships to load. This is 75,000,000 tons of yet unrefinable oils. But the people of North America already mine and burn equivalent of nine times as much in tonnage of solid fuel. The curve of coal demand is ever rising. The whole world wants liquid fuels for its navies and its merchant fleets, its railways and its furnaces.

Colloidal Fuel.

One of the things that will conserve oil is a new fuel known as "colloidal fuel." It is a combination of liquid hydro-carbons with pulverized carbonaceous materials, which components are so combined and so treated as to form a stable fuel capable of being atomized and burnt in a furnace in the same manner as oil and practically without any changes in the oil equipment. All kinds of oils and solid carbons may be used. The cheap coal breakages and wastes are all available. The coal or carbon particles are maintained in a state of suspension in the oil during the time required before use—be it days, weeks or months.

Colloidal fuel enjoys several special qualities. The calorific value per unit volume is greater than that of straight oil unless coals of very low heat value and specific gravity are incorporated. The reason is that coal is heavier than oil, though of less calorific content per pound, so that the coal content most frequently raises the calorific value per unit volume. The addition of coal is not an adulteration of the oil, but it makes an increase of the heat units in the resultant gallon of liquid fuel. Thus in a composite made up of 35% by weight of pulverized anthracite coal of 14,000 B. T. U. per pound and 1.6 specific gravity, and 65% oil of 18,200 B. T. U. per

pound and .96 gravity, a gallon of the composite has 165.-000 B. T. U., while oil has 146,000 B. T. U. per gallon.

Owing to its coal content, colloidal fuel is heavier, while oil is lighter than water. The character of the composite is such that it may be stored under a water seal and its fire may be quenched with water. This feature is of vast importance, since an oil fire cannot be extinguished with water, and hence the rules governing the use of fuel oil are justifiably drastic. Not less than 6.4% of all fires are caused by fuel oil according to the records of the National Fire Prevention Association.

The Board of Standards and Appeals of New York City adopted a set of rules which became effective December 1, 1919, to admit liquid fuel into the city. Rule 1 contains the following provision:

"The term 'oil for fuel purposes' under these rules includes any liquid or mobile mixture, substance or compound derived from or including petroleum."

The rule is phrased so as to admit colloidal fuel, which is a liquid or mobile mixture including petroleum. Colloidal fuel is also in an exceptionally favorable situation under the tentative regulations of the National Fire Protection Association, adopted on November 3, 1919. These set the standard in the United States and Canada.

The combining of pulverized coal with oil and of tar with oil, to make a liquid fuel, has in the past had inventive devotees. As, however, petroleum does not ordinarily dissolve coal or tar, the problem was how to overcome the comparatively rapid and uncontrollable separation of settling out of sedimentation of some of the components. The present success was born immediately of the war efforts and was conceived to meet the possible shortage of liquid fuel in the allied navies.

The superiority of atomizable over solid fuel has long been recognized and proven. The advantages are both in conservation and operation. Further, the cost and coming scarcity of refinable oils has set metes and bounds for their employment. Several causes have made desirable the evolution of a process for combining the cheaper or more plentiful sources of carbon with the liquid hydrocarbons. The former are generally solids such as coal and lignites or tars and pitches.

The literature of colloidal fuel is, naturally, very recent, and also very limited as yet. The matter had to be kept strictly secret during the war and publications were carefully edited. Several authoritative articles have, however, been published regarding it. The Submarine Defense Association published certain reports of its own. During the war, the process of manufacture was for military reasons necessarily kept secret. After its close, measures were authorized to obtain for the new creation the patent protection to which it was entitled in all the leading countries. Recognition of rights has now been established, so that it will be shortly permissible to publish the details of the process of manufacture.

Coal as a Fuel.

The Geological Survey gives to coal six classifications. They are anthracite, semi-anthracite, semi-bituminous, bituminous, sub-bituminous and lignite. All of these various classes are produced in the United States. Most of the anthracite is mined in eastern Pennsylvania. Small areas in the West are placed in the anthracite classification, but are not identical with the Pennsylvania anthracite. Anthracite is almost an ideal domestic coal, but is not well adapted to steam raising, although it is used for this purpose when an absolutely smokeless coal is required. There is very little semi-anthracite, hence it is a small factor in the trade.

Semi-bituminous is of higher rank than bituminous. It has a high percentage of fixed carbon which makes it nearly smokeless. It is best adapted to raising steam and to general manufacture that requires a high degree of heat. It is regarded as the best coal for steamships and is used almost exclusively by the navy. Being of a soft, tender quality it is easily broken; this fineness is regarded by those accustomed to lump coal as detrimental, but it is not. It burns slowly and gives a high degree of heat.

Bituminous coal is produced in a number of grades, but, generally speaking, it describes a rank of coal having about equal proportions of volatile matter and fixed carbon. It is only slightly affected chemically by weathering unless it is exposed for many years.

Sub-bituminous is a term adopted by the Geological Survey to describe a rank of coal more generally known as black lignite; it is produced principally in the western states. It is a clean domestic coal and ignites easily.

Lignite is a product of North Dakota and Texas and is also found in large quantities in western Canada.

In engineering literature the comparative efficiency of fuels has been buried in the figures of "boiler efficiency." In such are centered the rivalries of a hundred makes of boilers and a hundred stoker devices, themselves survivors of the fittest. We come close to knowing the makes that lead. From their records we extract most of the data which prove the actual caloric energy that may be developed by liquid fuel as compared with pulverized, hand-fired or stoker-fired coal.

Many confuse the theoretical heat values of oils and coal with their practical heat or steam making values. The B. T. U. in coal, no matter whether fired by hand, by automatic stoker or pulverized, are directly inferior in ultimate results produced to the same number of B. T. U. in liquid fuels.

It takes by the accepted standard 33,479 British Thermal Units to yield a boiler horse-power hour. A boiler that would deliver a horse-power for that number of heat units would be 100% efficient.

In burning coal by hand firing, the losses are great, due:

First, to incomplete combustion;

Second, to the necessity of cleaning fires, and

Third, to the rapid deterioration resulting from sudden cooling of the boiler during the fire cleaning periods.

Then, too, lump coal usually contains more or less slate or other incombustibles.

Hand operated furnaces are, therefore, used only in small installations and on steamships where space is not available for automatic stokers. In the use of automatic stokers, a great step forward was made, resulting in more complete combustion, less depreciation and less cost for labor operation. However, when the methods were perfected for pulverizing and burning coal in pulverized form, the best results, from the standpoint of efficiency, were reached.

Many obstacles had to be surmounted before pulverized

coal could be used on a large scale. The question of storage, the prevention of spontaneous combustion, and the proper methods and apparatus for burning required research and experience to perfect. Today there are many plants using pulverized coal for steam purposes, and many of the advantages heretofore afforded exclusively by gas and the burning of oil are now enjoyed in burning of coal in pulverized form. The method of crushing and burning the coal applies to all grades, even the lignites being available for fuel in this form. In order to use this fuel it is necessary to equip a plant for drying, crushing, screening and conveying the product to the burners, where it is mixed with the proper amount of air to blow it into the furnace and it is burnt in such a perfect manner as to obtain practically perfect combustion without smoke and with a very small percentage of ash. This fuel burns practically flameless, creating a red hot glare in the furnace only. Like oil, the use of pulverized coal permits of increasing the steaming capacity upwards of 50% with a given boiler capacity above the builder's rating.

Pulverized coal can be burnt with the ease and practicability of an oil or gas fired operation. The advantages obtained by its use are numerous, the principal ones being the ability to obtain high economy and with the same equipment to utilize coals of any grade, regardless of quality. All ranks of coal are now being burned in pulverized form, and unless the percentage of ash for a given coal is present in excessive quantity, it has no particular effect upon the combustion conditions. Therefore, where low grade and low priced coals are available, they may be used with entire satisfaction.

Many failures resulted in the early days due to not fully understanding that when pulverized coal was applied to certain types of furnace, the combustion chamber and flues had to be proportioned to suit the quantity of fuel used in a given period of time in order to have a practical operation.

The question as to the adaption of this fuel for any particular installation would naturally depend upon the local conditions and location of the plant. Generally speaking, unless the quantity of coal used amounts to 100 tons daily or more, pulverized coal would not prove economical, unless the fuel required could be obtained from a central pulverizing plant. In plants with this tonnage and upwards it should make a very profitable investment.

One solution of the problem of the future for producing power for all purposes at a low cost is to use the various low grades of coals that are comparatively cheap and burn them with high efficiency.

While it is true that the price of oil seems to be going higher, it is equally true that the cost of mining is also increasing, together with the cost of transportation of the coal, so it is difficult to say what fuel would be best without knowing the conditions and location of the plant.

It is safe to say, however, that where a number of plants are adjacent to each other, a central pulverizing plant for coal might be installed, from which the several plants could draw their supply, and in this way reduce the cost of operations. I believe that plants can be arranged in such a way that they can be changed to burn oil or coal without undue expense, whereby the market conditions can be taken advantage of and the fuel that is cheapest can be used.

It is interesting to note that, according to an estimate made by the Geological Survey, the waters of the United States by their natural flow, exclusive of dams, can produce 27,943,000 horse-power at a minimum, which would be more power than is now furnished by both coal and oil for steam purposes.

I would not advise any manufacturer to change his plant without first determining, through the advice of a competent efficiency engineer, what should be done to increase his economy in the use of fuel after the local conditions have been carefully studied and the fuel situation as a whole carefully analyzed.

Cotton Manufacturers Meet at Boston.

(*Continued from page 476.*)

We have developed by wise economic measures a higher standard of living in this country than in any other country on earth. We pay here the highest wages paid in the world. America is an industrial democracy. Here there is not merely a class of workers but all classes work. It is a system whose foundations are laid upon the broad national policy of protection. If we are to retain our place as the foremost manufacturing country of the world and maintain our high standard of wages and of industrial efficiency, it will again become necessary to apply that policy of protection which has diversified our industries, multiplied opportunities for employment and made us strong and prosperous.

The National Association of Cotton Manufacturers urges loyal cooperation between employers and employees in order that the increased production of the necessaries of life may more nearly equal the demand for goods and thus reduce the high cost of living. We believe that the worker is entitled to a fair wage, to healthful conditions of labor and to reasonable working hours.

We believe that war-time profits and war-time taxes should give place to the reasonable profits and reasonable taxes of times of peace. We stand for orderly government under the law; for a square deal for capital and labor; for equal opportunities for all our citizens; for the Americanization of the foreign-born within our borders and for loyalty to our Constitution and our Flag in peace as well as in war.

Whereas, Congress by the passage of the Transportation Act has declared it a national necessity that the railroads shall function continuously and efficiently, and has empowered the Interstate Commerce Commission to so regulate and supervise them that this purpose be accomplished; Therefore, be it

RESOLVED, that The National Association of Cotton Manufacturers pledges its support to the Commission, and its assistance to the carriers in their efforts to so readjust rates, that advances be equitably distributed, without unwisely distributing present territorial or commodity relationships.

RESOLVED, that The National Association pledges its assistance to individual carriers, where the conditions under which they serve the public may warrant special consideration in the division of the earnings upon traffic handled jointly with other carriers. And be it finally

RESOLVED, that The National Association pledges its assistance to the carriers in their efforts towards efficiency in operation and conservation of equipment, by the prompt loading and unloading of cars, and by loading individual cars to their maximum capacity in so far as is possible.

The offices of the industrial bearings division of the Hyatt Roller Bearing Company have been moved to a new building at 100 West 41st Street, New York City, where much larger quarters have been secured for the advertising, sales and engineering departments of the division. The new building is very conveniently located, being only one square from 42nd Street, from Broadway and from Fifth Avenue, the three most important streets in New York. All customers of the division are cordially invited to use these offices as their headquarters while in New York.

The crepe-hanger is an institution. He is just like a weed serving no useful purpose, yet hard to exterminate. When looking at the doughnut, he thinks of the hole; when things go well today, he thinks of the morrow.—*Tallassee Briefs.*

Our Stake in the Pacific

BY C. F. WEED.

In a seven months' trip through the Far East, including Australia, Java, Straits Settlements, China and Japan, I saw many opportunities for the development of American foreign trade, but the one big opportunity, in my opinion—the one that measures up to the title "Our Stake in the Pacific"—is China.

I do not think that we have in this country any real appreciation of the tremendous potentialities of China or of how quickly some are likely to become actualities.

To begin with, let us marshal a few facts which every school boy ought to know but doesn't. Territorially China is about a third larger than the United States. These people are sober and industrious. They have to be industrious, otherwise they would starve. For the most part they are woefully ignorant. China has nothing that can be termed a general educational system. I have heard it stated by good authority that probably 399 out of the 400 millions of people did not know that there had been a World War. Yet they are a wonderful people.

They are the finest of artisans,—witness their silks, their embroideries, their carvings requiring infinite skill and patience. I visited an electric lamp factory in Shanhai operated entirely with Chinese labor under American management. The manager told me that in quantity and quality, hour for hour, the output was the equal of any of their American factories, and this native labor works a twelve hour day and a seven day week and at a scandalously low wage compared with American labor. The Chinese industrially are competent.

It is said, and with some truth, that the Chinese are not organizers. But the race which built the great wall of China, the most stupendous work of human labor in the world—a gigantic piece of masonry that would stretch from Boston to San Francisco—is not totally lacking in organizing capacity.

As farmers the Chinese achieve wonderful results. They labor with the crudest implements. Methods have not changed in thousands of years. Wheat is still winnowed as in biblical days. With his farm, however, and his hand loom the Chinese farmer is almost self-supporting in every way.

As merchants the Chinese excel any race I know. It is proverbial in China that they out-trade the Jews. They have an inexhaustible supply of patience. Time is of no object. If you undertake to introduce a new "chop" in piece goods, for instance, you will sell initial orders quite freely perhaps. The repeat orders will not come. The next year and the year after you can offer that "chop" with no buyers. The third year, however, will bring a flood of orders if the goods have stood the test and the test has been that of two years' actual wear by the ultimate consumer.

The Chinese are proverbially honest. Not to be out of debt for the Chinese New Year is to lose "face," and a Chinese would rather die than lose face. When I say that the Chinese are proverbially honest I do not refer to Chinese government officials. They are notoriously dishonest. The word is not "graft" there. It is "squeeze," which is the same thing, only more so.

But if this is all true, you say, what makes you think that China is suddenly going to become such a big factor in American foreign trade?

The upstanding reason why China is not already one of the biggest factors in world trade is the lack of internal transportation facilities. In all that vast country there are only about six thousand miles of railroad as against at least two hundred and fifty thousand miles in this country. Adequate transportation facilities will not be provided for China in this generation or the next but let us see what the possible effect may be of a comparatively small development which is already under way.

Hankow is at the head of big steamer navigation on the Yangste Kiang about six hundred miles up from Shanghai. Beyond Hankow to the west is the big, fertile province of Szechuen. It has a territory greater than the combined areas of Italy and Greece. It has a population greater than that of the German Empire. It can now be reached only by a long circuitous caravan trail or by way of the Yangste River through a series of gorges one hundred miles in extent. Of course the purchasing power of that province now is negligible. Wheat is selling there at ten cents per bushel. The price of goods from the outside world when finally landed there is prohibitive. A can of oil which sells for $3.40 in Hankow costs $10.30 in Chengtu. But what will happen when the railroad penetrates this inner empire? These eighty millions of people will find it worth their while to abandon their laborious hand looms and go to producing raw materials for the world's markets. With the proceeds from these raw materials they will buy piece goods and other manufactured products in quantities never before dreamed of.

Notwithstanding the antiquity of this province in the matter of civilization, a brand new major country is about to be introduced into the world's market. And this is only one instance.

So I say that our biggest stake is now growing in the Pacific, and growing faster than we are preparing to grasp it, and that stake is China.

It is true that American business is now represented in China, but in a pitifully small crude way compared with its deserts and compared with the representation of other countries.

Take the British. They have been firmly established in the Chinese trade for generations. The class of men who go out from England into the Far East is, I am sorry to say, far superior to the class that has been sent out from America. Of course I am speaking in general terms. American business houses have not grasped the fact that China is an international market with the keenest kind of competition and that only the best men can secure real recognition. The British houses are solid, substantial institutions, owning their own "godowns," dealing in a large variety of manufactures, owning or controlling their own

*Delivered before the National Association of Cotton Manufacturers.

steamship lines, and aided and abetted in every way by their government at home. The American houses, and again I am speaking generally, are comparatively insignificant affairs, staffed by a catch-as-catch-can personnel, frequently carrying only one line, heretofore dependent upon foreign shipping, and hampered more than helped by their own government. How hampered, you ask? A British concern in China does not pay income taxes at home. An American concern does. Handicap No. 1.

And yet the Chinese seem to prefer to trade with America to any other country.

In the first place, America is the only power in China that is not looked upon as a predatory power. As a nation and as individuals we enjoy a reputation for being fair. The return of the Boxer Indemnity has not been forgotten. American goods square with the sample, which is more than can be said of the Japanese goods. The American is deferential to the Chinese buyer, as he should be, but as the Briton is not.

If things are anything like equal, the American house will get the orders.

There is no danger of loss in China through bad debts. That is a sweeping statement, but it is true. The reason for it is the so-called "compradore" system. Every foreign house, mercantile or banking, employs a "compradore." He is a Chinese of standing who, for a small commission, guarantees the fulfillment of obligations at maturity. The compradore gives a bond, or a cash deposit, or both, amply adequate to secure his own undertakings in this regard. The deposit of a million dollars in gold in a foreign bank by a Chinese compradore as security is not uncommon. If the business is all over China he has his bonded agents under him.

This system is an institution in the Chinese trade and eliminates all credit risk.

To recapitulate:

I maintain that America's largest stake in the Pacific is China for the following reasons:

1. China already has a large foreign trade.
2. Through improvement in internal transportation facilities and for other reasons this trade will shortly be doubled or even trebled.
3. This trade is friendly disposed toward America.
4. It is a good credit risk.
5. Adequate shipping can be had.
6. The larger American banks are prepared to offer excellent banking facilities.
7. Some American houses now know how to do this business. Many are learning. More are eager to learn.

I further maintain:

1. That every American house equipped to do a foreign business should carefully study the Chinese situation.
2. If satisfied that there is a market for its product in China it should (a) open its own office there, or (b) entrust its agency to a thoroughly representative American firm with offices in the leading Chinese cities.
3. If it opens on its own account, it should employ only experienced men of the highest grade.
4. If it opens through a representative, it should make certain that the house is substantial financially and of a dignified tone. A slap-dash, spread-eagle atmosphere is not conducive to good standing in China, and this atmosphere is too likely to be a characteristic of an American house.

Chlorate of Potash.

In view of the many serious disasters that have been directly or indirectly attributable to the presence of chlorate of potash (Potassium Chlorate), a brief note on this substance may perhaps be instrumental in leading to a more general knowledge of its dangers, resulting in further restriction and more careful handling, both of which are necessary if a repetition of the disasters of the past is to be avoided.

Chlorate of potash, one of the important salts of chloric acid, is a white crystalline substance, usually handled in lump or powdered form.

It is produced largely by electrolytic decomposition of potassium chloride, though it may also be produced by passing chlorine gas through milk of lime and adding potassium to the mixture, or by adding chlorine to hot concentrated caustic potash.

It is composed chiefly of chlorine, potassium and oxygen, and will decompose with the liberation of oxygen from slight mechanical or chemical action, which fact is the chief cause of its danger.

Pure chlorate of potash will decompose and burst into flame with explosive tendency instantly if brought in contact with sulphuric acid, phosphorus, antimony sulphide, or potassium cyanide. Under ordinary conditions chlorate of potash gives off oxygen at about 350 degrees C., the amount of oxygen increasing with the temperature, until a maximum of about 40 per cent oxygen gas is produced, potassium chloride remaining. Owing to its valuable properties its uses are many. In many laboratories it is used in the production of oxygen gas. It is used extensively in the manufacture of fireworks, matches, colored fires, explosives, in fabric printing and bleaching establishments, and also for medicinal purposes. Hence the demand for it is great, and suitable provision must be made for handling and storing it.

Chlorate of potash should never be housed in the same building with organic or combustible substances, and premises in which it is to be stored should be thoroughly cleaned and free from any accumulation of particles of combustible material before the chlorate of potash is brought into the building. If, for example, a cargo of chlorate of potash in kegs be received into a warehouse that has been used for the storage of flour, starch, charcoal, sulphur, wood pulp, or any combustible material producing dust in handling the mixture of small particles of chlorate of potash such as are likely to slip through the cracks and seams in the kegs and particles of inflammable dust remaining on the floor would be exceedingly dangerous and might easily be ignited by the frictional heat of a footstep, or by a smouldering match, cigarette or cigar.—*National Fire Protection Association Quarterly.*

The Diamond State Fibre Company, Bridgeport, Pa., announces the establishment of A. M. Fraser as district manager for the company, with headquarters in Greenville, S. C. Mr. Fraser is now in a position to give the southern textile mills direct personal service in the supplying and maintaining of the mill equipment manufactured by his company.

Buying Cotton Net Weight*

BY J. R. MACCOLL.

Buying cotton net weight has been discussed by growers and spinners for more than a decade. There should at the outset be a clear understanding as to what is meant by the phrase, "Net Weight." "Gross Weight" is the weight including the tare: "Net Weight" is the weight after the actual tare is deducted.

All other textile materials are bought on a net weight basis. No one would think of buying silk, wool or linen and paying the same price for the covering as is paid for the material itself. Cotton grown in other parts of the world is also bought on a net weight basis. This includes Egyptian, Peruvian and Indian cotton.

When cotton was worth five to ten cents per pound—as we have seen it in bygone years, there was less incongruity in paying the same price for both cotton and tare, but with cotton now worth from forty cents to a dollar per pound, the uneconomic character of the system becomes more striking.

The argument for buying net weight, however, is not based entirely on the above considerations, but on the fact that the present system of buying gross weight by American spinners, and on a fixed six per cent tare basis by foreign spinners, stands in the way of an improved American bale and is also an injustice to the cotton growers. Just so long as foreign spinners use the six per cent contract and think they are buying cotton net weight because six per cent is deducted for tare, the middleman who sells them will put six per cent tare—or thirty pounds of bagging and ties per bale—on the cotton *and add six per cent to the price of the cotton*, that it may afterwards be taken off.

As regards New England, so long as spinners buy on a twenty-four pound tare basis, that amount of tare will be used on the cotton, and there will be little inducement to make a radical improvement in the American bale and make it more like bales from Egypt and other countries.

The injustice to cotton growers is also apparent. In the Southern states, when cotton is bought from the grower, the buyer figures as if the bale had six per cent tare; while it actually at the gin compress has only about twenty pounds of tare per bale, or four per cent tare. Arizona cotton is bought from the grower on a net weight basis, but is later sold to the spinner on a gross weight basis.

The growers are consistently on record as in favor of net weight buying, and cannot understand the dilatory attitude of spinners in adopting the system on a wide scale.

The merchants or shippers are not opposed to the system and are ready to quote cotton on a net weight basis if the spinners want to buy in that way. Leading members of the New York Cotton Exchange have recently put themselves on record with the National Council of American Cotton Manufacturers as in no way opposed to net weight buying.

When the Lancashire Cotton Investigation Commission visited this country in 1906, they made a thorough investigation of cotton conditions in the South. The members of the Commission realized for the first time that English spinners had been actually paying the price of cotton for thirty pounds of tare per bale, or six per cent. They found at the compresses that cotton going to England was invariably loaded up with thirty pounds of tare, while cotton for New England had only twenty-two pounds of tare, which was the general standard at that time. They also found that the price of cotton was divided by 94 in order to get at the price for England as compared with the price for New England. In other words, under the C. I. F. and 6% Contract, they were not buying cotton on net weight as they thought they were, but were practically compelling the southern shippers to put extra patches on the bales to bring the weight of tare up to thirty pounds, and they were paying the price of cotton for the thirty pounds of tare.

At the Washington Conference of Growers and Spinners held in 1906, in which the Investigation Commission participated, it was unanimously voted—"That all cotton should be bought and sold net weight."

In the report of the Investigation Commission, it is stated—"If the bales are meant for home consumption, they have little bagging upon them; if they are coming to England they have much. The explanation given of this different treatment is that American spinners are charged for the bagging, whilst the Rules of the Liverpool Cotton Exchange demand an allowance of six per cent for tare, and good care is taken to put on that amount."

At the Milan International Cotton Congress, in 1909, the Chairman, Arthur Kuffler, said: "As you are aware, a Cotton Contract Commission was appointed some time ago, with H. W. Macalister as its head, and one result of their labors has been the net weight contract for cotton. On that point, I am reminding you of a remark made at the Paris Congress by J. B. Tattersall, to the effect that if the International Federation had done nothing else, the establishment of the net weight cotton contract would repay them for all the trouble and expense to which they have been put. After long discussions and much work by Mr. Maclister, the Liverpool Cotton Association has adopted the net weight cotton contract, but that does not compel anybody to use it. The next step will have to be taken by the spinners. I think we shall make ourselves rather ridiculous if, after having spoken so much of the necessity of introducing the net weight contract, and after having succeeded in getting it accepted by the Liverpool Cotton Exchange, nobody makes any use of it. It is not likely that an individual spinner, accustomed to do business under the old system, will make a start and ask his agents to begin under the new contract. That ought to be done by combined action. I understand it will be the most important work of this meeting to find out a way to introduce this contract, and so to give it a better trial than it has had so far. We ought to get the various organizations to impress upon their members from a given date—say, September next—to buy 25 per cent of the cotton they import under this arrangement. Nobody can engage himself to buy all his cotton in that way. Then, when the contract has been given a fair trial, everyone will

*Delivered before the National Association of Cotton Manufacturers.

be able to see for himself whether it is beneficial to him or not."

At the Annual Meeting of the National Association of Cotton Manufacturers, held in Boston, April, 1910, the following resolution was adopted:

"Resolved: That this Association favors the buying of cotton on a net weight basis, believing that if this system is gradually adopted, the ultimate effect will be to improve the American bale by removing the inducement to use an unnecessarily heavy covering."

On May 18, 1910, the Arkwright Club took the following action:

"The subject of the movement to introduce the purchase of cotton at net weight was discussed, and it was voted—That the Arkwright Club is heartily in favor of the movement to substitute the system of buying cotton at net weight for the present system, and expresses the hope that the International Federation of Master Cotton Spinners' Associations will devise a practicable method of introducing such a system."

At the meeting of the Executive Committee of the International Federation of Master Cotton Spinners' and Manufacturers' Associations held in Paris, September, 1919, the following resolution was adopted:

"That all gin-pressed bales should be sold on the net weight contract."

At the World Cotton Conference, held in New Orleans in October, 1919, nine out of the eleven classes of business interests represented, including all except the compressors and cotton merchants, approved the following resolution:

"We recommend that all cotton be bought on a net weight basis, actual weight of tare to be deducted."

The history of this movement, it seems to me, affords ample evidence of the world-wide attitude of the spinners and growers to this simple but fundamental reform. At the Washington Convention in 1906, Judge Ogden of Texas in classic language described the American cotton bale as a "dirty, damaged, disreputable, water-soaked, wasteful, slovenly, clumsy, highly inflammable, turtle-backed package." I have never met anyone who had the audacity to defend the present American bale. When the British Cotton Growing Association took up cotton growing in West Africa a few years ago, the bales that were turned out were ideal in every respect as regards density, character of covering, and weight of tare. We all know the satisfactory character of the Egyptian bale. For the reputation of our country and the Southern cotton-growing states, it is surely time that there was a forward movement in the direction of a decent American bale. If the spinners can aid in the movement by buying cotton at net weight—and this seems to be the judgment of the men in the industry who have studied the subject carefully—then why in thunder don't we get busy and put it into operation?

There will probably be neither saving nor loss at first in the operation. The seller will add to the price of the cotton an amount equal to the value in cotton of the weight of the tare, minus the cost of the bagging and ties. Later, when the system is largely adopted, cotton will normally be quoted on the net weight basis, and the gross weight basis will be abnormal quotation, until it is entirely done away with.

When the growers, compressors and merchants realize that there is no advantage in loading the bale with unnecessary tare, they will more readily respond to the demand of the spinners for a standard American bale, the covering of which should be burlap or cotton Osnaburg, with ties similar to those used on the Egyptian cotton bale. This requirement is covered in one of the resolutions adopted by the Atlanta Conference, in the following language:

"Resolved, That we condemn the bagging now in use—first, because of its rough and coarse nature it invites rough treatment; second, it does not hold the marks; third, on account of its great weight and bulk it entails heavy loss in freight. We therefore recommend the use of a light burlap or covering made of cotton such as Osnaburg, 10 oz. weight per yard, 40 inches wide.

"Resolved, That we recommend that all planters, wherever practicable, put in as rapidly as possible gin compresses; that the square type of bale is preferred by the great majority of spinners, and that the Egyptian character of bale is the best type; that the ties upon the standard bale be 10 in number, the length of the bale be 48 inches, and width 21 inches, the weight 500 pounds, the density 35 pounds, the bale to be marked upon both ends with weight, grade, and staple."

And in resolutions of the New Orleans World Cotton Conference approved by nine out of the eleven classes of business interests, but rejected by the compressors and cotton merchants:

"Whereas, cotton in the present so-called standard bale of density 22½ pounds to the cubic foot, often arrives at destination in a ragged and dirty condition, causing much trouble and expense to the spinner, therefore,

"Be It Resolved, That the United States Railroad Administration be requested to formulate such rules and regulations for the acceptance of shipments of cotton as will cause the compressed density of a bale to be not less than 32 pounds per cubic foot, and of standard dimensions, the same to become effective August 1, 1920.

"Resolved, That the United States Railroad Administration be requested to establish such differential between rates on cotton compressed to a density of 32 pounds and that compressed to a density of 22 pounds or less as will encourage the shipment of the higher density bales.

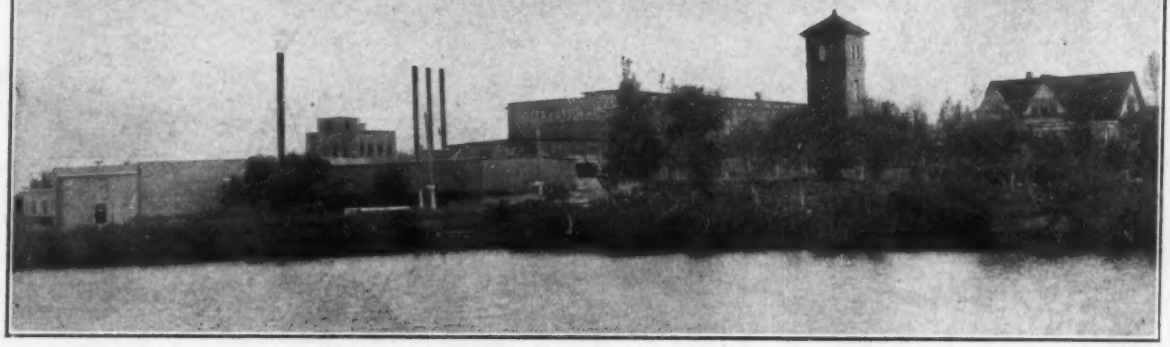
"Resolved, That the United States Railroad Administration be requested, by rules and regulations, to prohibit the re-marking of bales en route."

There is need for closer, more frequent and more cordial relations between the forward-looking leaders in the South, representing the cotton growing interests, and the spinners' and manufacturers' associations. There is large opportunity for economy in the handling and marketing of American cotton. The first and most practicable step in this direction is, in my opinion, the buying of cotton on net weight.

The Barrett Company, New York City, has issued a booklet which relates to one of the products of this company—Everlastic Fibre-Coating. Readers may obtain free copies by writing any of the Barrett offices.

No man was ever endowed with a judgment so correct but that time and circumstances could teach him something better.

What the Southern Mills are doing



The Plant of the Opelika Cotton Mills, Opelika, Ala.

There has been less said of the industrial expansion in the South, particularly in the textile manufacturing industry, than the subject deserves. But in various places are rising the walls of vast new mills and factories, which in due course will be turning out new supplies of textiles to meet the apparently insatiable demand of the world.

Among these is the large addition which the Riverside and Dan River Cotton Mills are constructing as an expansion member in their mills at Danville, Va.

This building is to be over 840 feet long by 145 feet wide. The unusual story height of 17 feet between floors will insure good light even in so wide a structure. At the same time, it will give the five stories a towering mass that will make the building a landmark for miles around. It will be built throughout of reinforced concrete which lends itself better than brick to the solid, non-vibratory construction essential where high speed looms are to be installed.

So many problems were presented in preparing plans for building this mill that the work of actual construction was given to the Atlanta office of the Aberthaw Construction Company whose reputation for surmounting every kind of difficulty is being maintained in the present operation at Danville. The new mill is being constructed on an island in the Dan River, the better part of a mile from the railroad which is now accessible from the town only by steep and rough roads.

Other expansion features, improvements and new mills noted during the last month follow:

Rest rooms, lockers and medical clinics have been established at the Knoxville Spinning Mills, the Knoxville Cotton Mills and the Tennessee Mills, at Knoxville, Tenn., for the employees of these three companies. At the Knoxville Spinning Mills the clinic room is complete in every detail for the care of sick employees. Daily examinations are made of those who are in need of them and the ills of the workers are looked after by a competent physician. Mrs. A. E. Cardwell, a trained nurse, is in charge of the clinic and has an assistant who visits the homes of the employees who are ill and sees that they obtain the proper medical care. This service is performed for the operatives free of charge. Dr. C. W. Rein is in charge of the medical work.

At the Knoxville Cotton Mills a clinic and rest room has been provided, in charge of Miss Lillian Fischer, a trained nurse, who is also in charge of the clinic work at the Tennessee Mills. At this latter plant, in addition to the clinic and rest room, a restaurant has recently been established for the convenience of the employees, at which they may obtain lunches at cost.

The Highland Park Manufacturing Company, Charlote, N. C., will spend $60,000 in improvements and new houses for the use of their operatives.

The White Oak Mills, which will add 3,000 additional looms to their present equipment at Greensboro, N. C., have let contract for 100 additional homes to be erected in their mill village.

The capital stock of the Swift Spinning Mills, Columbus, Ga., has been increased from $300,000 to $2,000,000. It was rumored that the company contemplated extensive enlargements, but E. W. Swift, president, denies this. "We have no idea of enlargements in the immediate future," he declared, "and only asked permission to change our charter so as to be prepared should we determine to spread out later on."

According to a report from Anderson, S. C., the Riverside Manufacturing Company of that place has increased its capital stock from $600,000 to $1,000,000.

A new cotton mill is to be built at Douglasville, Ga., by V. P. Smith, J. F. Long and M. E. Geer. Contracts for the machinery have already been awarded. The plant will operate 5,000 spindles on medium count yarn.

The Mecklenburg Mills, North Charlotte, N. C., have retained E. S. Draper, landscape architect and city planner, Charlotte, to plan and carry out improvements to their mill village.

The Russell Manufacturing Company, Alexander City, Ala., is erecting its fifth mill, which will operate at Alexander City under the name of Russco Mills, and which will have 11,856 spindles on underwear yarns. The capital stock is $500,000.

The Sibley Manufacturing Company, Augusta, Ga., are planning the revamping of their water power plant and

dyehouse, together with improvements to the slashing and humidifying equipment.

The Rocky Face Spinning Company, which took over the Stony Point Manufacturing Co., at Stony Point, N. C., recently, as noted, will erect a large addition to the present plant. New machinery to cost $225,000 will be installed, including 6,048 spindles.

The Indian Creek Mills, Lincolnton, N. C., owned by L. N. Ruddishley and H. S. Robinson, have been sold. D. P. Rhodes, Paul Rhodes and M. C. Quickel, the purchasers, who formerly owned the Anderson Mills of Lincolnton, have incorporated the Indian Creek Mills under the same name, with a capital of $250,000. The mill has 3,000 spindles on 20s yarns.

The Keowee Yarn Mill, Walhalla, S. C., has increased its capital stock from $80,000 to $200,000. Work on the mill is nearing completion and it will probably be in operation within a few weeks.

The Carolina Cotton & Woolen Mills Company will erect a 250 x 150 foot, saw-tooth construction extension at its plant at Fieldale, Va., at an estimated cost of $100,000. It will install 300 Jacquard towel and crash looms.

The Rex Spinning Company, Ranlo, N. C., will erect a 130 x 125 foot brick and steel construction addition and install therein 4,096 spindles. The machinery has been purchased.

Building permits have been issued to the Thatcher Spinning Mills, Chattanooga, Tenn., for the erection of two additional buildings to be built on ground adjoining the present site of the concern. The buildings, which will cost $450,000 and will be known as Thatcher Mill No. 2, will house 32,000 spindles which will more than double the capacity of the mills.

The Mayes Manufacturing Co., Maysworth, N. C., has contracted for a new office building to cost $80,000 and also for two church buildings.

The Tennessee Textile Mills, Inc., Chattanooga, Tenn., have purchased additional land upon which will be built about eight or ten five-room houses for the use of operatives of the company.

The Mary-Leila Cotton Mills, Greensboro, Ga., will spend $200,000 in improvements including the installation of new machinery, improvement of the power plant and the erecting of additional cottages, etc.

Work has begun on the construction of the cotton and rubber mills of the Ray Tire & Rubber Company, at North Birmingham, Ala. It is reported that a cotton mill with capacity sufficient to make all the fabric used by the tire company will be erected.

The Enoree (S. C.) Cotton Mills are installing approximately 115 additional wide looms.

W. D. McNeill and others are reported to be promoting the erection of a new cotton mill at Brunson, S. C. The proposed capital stock of the company is $300,000.

The Beaver Cotton Mills, Thomson, Ga., are equipping their village and houses with electric lights.

The Diamond Cotton Mills, Salisbury, N. C., recently noted as having incorporated, will erect a $75,000 mill construction addition to contain 7,400 spindles.

A $15,000 laundry is being installed in the basement of the cloth room of the Monaghan plant of the Victor-Monaghan Cotton Mills Co., at Greenville, S. C., to do work for the residents of the mill village at the rate of 6 cents a pound. W. T. Rhodes will be manager of the laundry.

The Spray (N. C.) Cotton Mills are just completing the installation of bale breakers and an automatic distributor. They are also making other improvements.

The Cannon Manufacturing Company, Kannapolis, N. C., will build another cotton mill near the present Mill No. 2, it is reported.

A report from Wilmington, N. C., states that the Bladenboro (N. C.) Cotton Mills Company is making preparations for the erection of its third mill. This new plant will have 10,000 spindles and will employ about 200 operatives, according to the report.

Citizens of China Grove, N. C., have organized a new cotton mill for their town with A. C. Lineberger as head of the corporation. A charter has already been applied for with a capital stock of $1,000,000. The proposed plant will have 10,000 to 15,000 spindles and building will begin as soon as machinery can be secured, the site for the plant to be near China Grove.

The Equinox Mills and Gluck Mills, Anderson, S. C., are planning the installation of a complete water supply system and a sewer system for the homes of their operatives.

The Mooresville (N. C.) Cotton Mills are to build a dye house and bleachery, 160 x 75 feet.

The Gastonia (N. C.) Cotton Manufacturing Company will erect a plant addition and install 5,200 spindles.

The Pilot Cotton Mills, Raleigh, N. C., have let contract for an addition to the dye plant building.

The New England Mill Situation.

Market conditions have continued to favor cotton manufacturers, the demand running in excess of the supply, and a very wide margin of profit upon production being easily maintained. During the month prices were named on percales for fall delivery by the large printers. A basis of 30 cents was established for 4-4 64 x 60s, white grounds, and 33 cents for 4-4 68 x 72s. The terms and conditions of sales varied in accordance with the varying views of the printers as to the permanency of prices now current. The agents of the Pacific Company granted protection on all goods sold to jobbers, with dating to October 1. The volume of orders to be booked were subject to limitations by the seller. The Algonquin Company granted protection to September 1 on goods billed before May 15 and to October 1 on goods billed after June 15. The American Printing Company sold only the goods it could produce in April, May and June, giving protection till July 1. The Windsor Print Works offered its goods without protection.

No difficulty was experienced in securing all the business the printers would take. The gray goods markets have been advancing until at this time 38½ inch 64 x 60s are quoted at 26 cents a yard, and 68 x 72s, 27 cents. A little over a year ago prices for these cloths were 8½ cents and 10 cents a yard. In October of last year 4-4 64 x 60 percales were priced at 22 cents a yard for light grounds. The prices on narrow staple indigo prints were advanced from 21 cents to 23 cents a yard for fall delivery, the gray cloths being held at Fall River on a basis of 16¾ cents. The demand for narrow prints for the jobbing trade was

larger than was anticipated and in 24 hours from the time the new prices were named, all the goods were withdrawn from the market. The printers have immense orders in hand, both for staple goods and for wash fabrics. Printed draperies have sold in a very large way.

The demand for wide sheetings has outrun capacity. The largest lines are under order into August of this year and sharp advances will be named if jobbers show a purpose of buying for still later delivery. Brown sheetings have advanced to a basis of 27 cents for 4-yard 56 x 60s. Orders for curtain materials in plain and fancy weaves have been extended into the late summer months at the highest prices yet paid. Branded bleached cottons have been less active than some other lines but all the finer qualities of plain lawns, nainsooks, and fine cambrics are so well under order that buyers must pay high for spot goods. In general, domestic goods, bleached and brown, are selling from 5 to 7½ per cent higher for spot and April delivery than for delivery in the last quarter of the year.

Colored domestics have not been ordered so freely as gray cloths for printing and converting. It is a little early for the jobbers to come in and the manufacturers using such cloths have a great many goods still due on past orders. No weakness in price has been observed, ordinary denims selling readily on a basis of 47½ cents for 2.20s for delivery three months hence, and tickings bringing a basis of 55 cents a yard for 8 oz., goods, if early deliveries are wanted. The demand for cheviots, trouserings, and similar goods continues full enough to take care of any surplus lots that come to hand as mill runovers.

The gingham markets continue very strong with the supply much under the demand at this time. The mills are very well engaged ahead. One of the notable features of the past month in gingham lines was the purchase of a controlling interest in the Boston Manufacturing Company by Amory, Browne & Co., who thus become the largest handlers of ginghams in the country. This account was merchandised for years through Lawrence & Co., two of the best known lines being the Indanthrene zephyrs and the Glenkirk zephyrs, both being very fine fancy ginghams, the former being made from combed yarns.

During February and the early part of March there was a congestion of cheap voiles and several of the grades of goods used for lining fabrics. It is not yet clear to what extent an inflow of English goods of this character caused a decline in prices but it is certain that some of the speculatively inclined converters found it necessary to unload. In the past two weks there has been a recovery from the low points and irregularity is less noticeable. The lining fabrics were affected adversely in some part by the hesitation in the clothing and garment trades arising from price resistance on the part of retailers.

All lines of shirtings are very well sold. Some of the lines were opened for the spring 1921 season during the past month and they have all been placed under order. Buyers are ready to take any goods offered by the mills. The fine yarn dyed qualities are especially scarce as there has been some revulsion to the cheap silks that flooded the trade last year. Consumers appear to be willing to pay high prices for the better quality madrases but are not now so willing to pay very high prices for the medium grades of silk shirtings.

During the past week or two repeat orders have begun to come in on flannellettes. This development was quite unlooked for at this time and it is taken to mean that advance sales have been larger than jobbers anticipated despite the high price levels established on these goods early in the selling season.

There has been a large demand for fancy fabrics for the coming spring. Mills have been unwilling to meet it freely, prices being satisfactory in every way. Manufacturers say they are finding it very difficult to induce weavers to accept fancy work when they can find so much work on plain fabrics at very high wages. Converters would like to introduce many novelties for the new season to compete with English goods or get away from the volume of printed goods now being offered.

While there has been a very full demand for goods, manufacturers have found business most difficult. One of the chief difficulties has been the disorganized conditions in transportation growing out of strikes at the ports, on the railroads, or among truck workers. The aftermath of the very severe winter, with its ice and floods, has left very muddy roads. There has been a constant shortage of cars, due in part to the inability to secure the cars that are owned by the railroads but have not yet been redistributed from other roads where they were sent under government control. Difficulties have multiplied to an extent that some finishers have been near to being forced to close although they have had plenty of orders ahead.

The labor situation is far from satisfactory. There is actually less unemployment than there has been in a great many years yet operatives are scarce and it does not seem as if any surplus is likely until immigration brings about a cure. As soon as warm weather comes it is expected that the great prosperity of the workers will lead them to go to the woods and the shores for the summer. It is expected that new wage demands will be presented during the coming month. Present indications are that at least 25 per cent increase will be asked. A strike of doffers at Fall River has been going on for some weeks. Half a dozen mills were closed and others were crippled but at this time it is felt that the manufacturers will win against the strikers.

Manufacturers were greatly interested during the month in a decision given at Memphis by a court called upon to pass upon the merits of the open price system of doing business. This system has been widely adopted in New England as elsewhere and there has always been a question as to how far the operations of the associations conflicted with the Sherman law. There are such associations among gingham manufacturers, fine goods mills, print cloth mills, blanket mills, and so on. On a rising market they have operated well and promptly for the seller.

Following the decision of the courts concerning the non-taxability of stock dividends, mills in New England have begun to issue such dividends in a large way. Propositions are now made public looking to the doubling of the capital of the Amoskeag and Nashua companies, the Nonquit Spinning Company of New Bedford, and several others of lesser capital. The Wamsutta mills and the Manomet Mills of New Bedford have called in new capital

to be issued to shareholders on a par basis. This action is all in line with a general increase of the capital of New England cotton mills to bring it more nearly in keeping with the costs of replacement today. Mill stocks continue to hold very firm on a high level and dividends continue on a record breaking level.

The importations of Egyptian cotton into New England this year have been the largest ever known, due to the poor supply of the fine long staples in the American crop, and to the persistent demand of the automobile trade for fine yarns and for cloths made from combed yarns. The cotton outlook is regarded more seriously by manufacturers at this time than at any time for many years. There is no question about the price, as there is profit margin existing sufficient to take care of the high prices now ruling. Anxiety arises from the fact that already more than 5,000,000 bales of an eleven and a quarter million crop have been exported, and domestic consumption is going along at the rate of at least 6,500,000 bales a year. The reserve supply of the old crop years consists largely of low grades and unspinnable cotton, a factor of major importance to the spinner, whatever the view of the speculator may be.

Efforts are still being made to buy the machinery of New England mills for shipment to the Far East. During the past month an agent has been seeking information as to where he could locate 2,000,000 spindles to be sold through banking interests for shipment to China. Little progress is being made, according to present reports.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, April 10th, 1920.

Instead of climatic conditions improving in the cotton region the past month, the weather has been generally unfavorable, especially in the central and eastern portions of the belt where there has been too much rain, while low temperatures prevailed in the southwest, freezing temperatures being had almost to the coast, necessitating replanting in some localities in extreme southwest Texas. As a result the middle of April finds preparations for the new crop more backward to the east of the Mississippi river than one month ago, but some headway was made in Texas and Oklahoma where the weather was somewhat more favorable as a whole.

Reflecting these developments a further substantial advance in values was recorded, the market now ruling at about the highest prices of the season for futures, spots and cotton goods. Contributing to the further improvement in values was the continuance of free exports to Europe, so far this season 5,335,000 bales vs. 3,687,000 to even date last year, now running on a basis for the whole season of 7,133,000 against 5,486,000 last season exclusive of Mexico and Canada. Probabilities are that shipments to Europe this season will total about 7,500,000 bales, or about 2,000,000 in excess of exports last season.

So far this season spinners of the world have taken of American cotton 9,517,000 bales compared with 7,899,000 to corresponding date one year ago, now running on a basis for the whole season of 12,090,000 bales, with prospects of the basis increasing in the future, likely resulting in takings for the season amounting to about 12,500,000 bales vs. 10,472,000 last season, or about 2,000,000 bales larger than last season.

Last season the world's consumption of American cotton was a little larger than the season's mill takings—10,620,000 against 10,472,000, and it is for this reason, and because of the large takings so far this year, that private estimates are for a consumption of American this season of 12,500,000 to 13,000,000 bales vs. 10,620,000 last season.

Compared with last year the world's visible supply of all kinds is 6,032,000 vs. 5,209,000 bales, of which 4,315,000 is American against 3,562,000, and foreign 1,717,000 compared with 1,647,000, but a large percentage is low grades, bollies, snaps, linters, etc.

The scarcity of high grades and staples has been instrumental in sustaining the market, and offerings of desirable cotton remain light and hard to buy except at higher prices.

While sales of spots have been somewhat larger of late, due to some improvement in the demand, business would be larger if offerings of good grades were more liberal. Had the demand been urgent, the market would probably be higher than it is. However, spinners are cautious, buying from hand to mouth only, depending upon the return of better weather and prospects for new crop to improve, which, it is thought, will check the advancing tendency of values and perhaps result in lower prices in the future.

There is no doubt that climate conditions will continue to dominate the future course of the market, and if the weather should improve and remain good for two or three weeks, and be followed by favorable growing conditions thereafter, it is possible that the tendency of prices may be downward again. On the other hand, if climate conditions remain unfavorable by means of alternating rains continuing, or if low temperatures are experienced after much of the crop is up, further delay and injury may result to the crop, in which event prices may be maintained or advanced further.

Peace with Germany is a possibility in the near future, and Washington press advices are to the effect that German bankers, merchants and business men anticipate early peace and are preparing for a great increase in American trade. Under the circumstances, and as prudence is the better part of wisdom, it would probably be advisable for American spinners to provide for their future requirements by buying on important depressions in preference to taking chances on the uncertainty of the future.

The Shawmut Engineering Company, with headquarters at 179-195 Freeport Street, Boston 22, Mass., has been established by E. F. Hathaway, formerly vice-president and general manager of the American Warp-Drawing Machine Company. The new company has purchased all the real estate, factory equipment and all machinery under lease of the American Warp-Drawing Machine Company, which recently disposed of its drawing-in business, together with all contracts and patent rights. The new company will continue the manufacture of carpet mill machinery, etc., making a specialty of the automatic reed-cleaning and polishing machine. The Atlanta Harness & Reed Mfg. Co., Atlanta, Ga., are the southern agents of the company.

The Yarn Market.

Authentic reports from the Philadelphia cotton yarn market indicate that more yarn was sold during the first week in April, and at relatively higher prices than was sold over a similar period during the 60 days previous.

The second quarter of 1920 began under the influence of practically the same factors that swayed the yarn market during the first three months of the year. One of the notable things about this is that April found dealers giving their customers the same advice as at the beginning of January: "Buy all yarns needed up to July 1." With spring, the natural season for cotton goods, at hand, there seemed to be more general tendency to be bullish over prospects.

During the second week, however, the market seemed to suffer a reverse. Advancing prices for counts scattered through ply carded weaving yarns and single carded knitting yarns featured. The high prices also proved a serious obstacle to moving weaving yarns in expected quantities.

Two reasons are given for the conservatism on the part of the buying end. There was a little too much yarn around in a good many counts for a sustained price rise, and the price range then in effect was so much higher than it was last April that buyers with any choice left them were thereby influenced to either avoid the market altogether, or cut down their takings to a minimum. Verification of the first of these reasons was found in concessions offered by spinners of 40s/2, 50s/2 and 60s/2 combed peeler skeins and warps. The second can be easily demonstrated by recalling that, exclusive peeler yarns, both weaving and knitting yarns were at this time held at rates twice those in effect in April, 1919.

With the rail strike causing some, though little, slackness of demand, restricted buying continued during the third week, largely as an extension of the cautious attitude taken by manufacturers with regard to purchases of any kind. In spite of a very moderate demand for yarns, however, prices were well maintained for the list in general while late sales show a tendency to stiffen in many counts.

Looking at the price situation from the viewpoint of the user of yarns, says an authority, he can no longer count on adding onto his own prices the higher rates he is now asked to pay for his raw materials. A good many of the larger merchants are airing their views at present as to the utter impossibility of their prices coming down, at least during 1920. This assurance is all right from their angle, as they have already bought goods far ahead, and know to a certainty that they will have to get still higher prices when the goods are sold to the public.

It is another matter for the manufacturer. His products in the hands of the merchant may be placed with retail consumers at new high prices next fall, for example; but the manufacturer has to consider that a rise next fall might suddenly mark the end of "generous" buying by the public, and if such should turn out to be the case, what would be the result of the manufacturer who plunged in too deeply at the present time, on the strength of the assurances now being handed out by the larger merchants?

This and other uncertainties, together with a feeling in some quarters that still higher yarn prices are unwarranted, have helped put a damper on buying in the yarn market. There are, of course, optimists who believe that cotton and cotton goods are in such world-wide demand that the manufacturer cannot hold out against the temptation to toss fears aside and defy fate with one more plunge.

Knitting yarns seemed to have the edge on weaving lines as to demand throughout the month and reports toward the end of April indicate that there is comparatively little knitting yarn available for delivery this side of August.

There is also a growing request for yarns going into tire fabrics. Of course, this is no new development but the extent of the development is something that many are losing sight of. For instance, a well informed authority claims that the output of tire fabrics at the present time consumes more yarns than the entire hosiery and underwear trades. While, of course, it is impossible to ascertain the exact consumption, nevertheless the influence of this demand upon a market practically bare of yarn is one of the more important factors in maintaining prices where they are, it is said.

Following are recent quotations on the Philadelphia market.

Southern Single Skeins.

4s to 8s	.72	10s	.75
12s	.76	14s	.77
16s	.78	20s	.90
24s	.93	26s	.97
30s	$1.05@$1.15		

Southern Single Warps.

8s	.73	10s	.75
12s	.76	14s	.79
16s	.82	20s	.92 @93
26s	$1.15	30s	$1.25@$1.35
40s	$1.85@$2.00		

Carpet and Upholstery Yarns in Skeins.

8-3-4 slack	.70 @71
9-4 slack	.71 @72
8-3-4 tinged tubes	.61 @63
8-3-4 hard twist waste	.62 @63
8-3-4 hard white warp twist	.65 @68

Southern Two-Ply Skeins.

8s	.72 @74	10s	.75 @76
12s	.76 @78	14s	.79 @80
16s	.82 @84	20s	.95 @36
24s	$1.06@$1.10	26s	$1.15@$1.20
30s	$1.30@$1.32	40s	$2.00

Southern Two-Ply Warps.

8s	.75	10s	.76 @78
12s	.78 @80	14s	.79 @83
16s	.88 @90	20s	.97 @98
24s	$1.06@$1.10	26s	$1.15@$1.20
30s	$1.30@$1.35	40s	$2.00@$2.10

Two-Ply Combed Peeler, Skeins.

20s	$1.65@$1.80	24s	$1.80@$2.00
30s	$2.00@$2.10	40s	$2.50
50s	$3.00@$3.25	60s	$3.50
70s	$4.00@$4.25	80s	$4.50@$4.75

Southern Frame Spun Carded Yarn on Cones.

8s	.73	10s	.75 @77
12s	.76 @78	14s	.77 @79
16s	.79 @80	18s	.82 @83
20s	.83 @84	22s	.84 @85
24s	.91 @92	26s	.95 @98
30s	$1.10@$1.15	40s	$1.60@$1.70
30s tying-in	$1.00@$1.05	30s double carded	$1.05@$1.15

Northern Mule Spun Carded Yarn on Cones.

10s	.80 @81	12s	.81 @83
14s	.83 @84	16s	.85 @86
18s	.87 @88	20s	.88 @90
24s	.92 @94	26s	.98 @$1.00
30s	$1.15@$1.20	40s	$1.60@$1.64

Northern Mule Spun Combed Peeler Yarn on Cones.

10s	$1.15@$1.16	12s	$1.16@$1.17
14s	$1.19@$1.20	16s	$1.21@$1.22
18s	$1.23@$1.24	20s	$1.25@$1.26
36s	$2.00	22s	$1.27@$1.28
26s	$1.35@$1.40	28s	$1.55
30s	$1.60	40s	$2.05@$2.10

That which counts is the grim determination to win which nothing but realization can satisfy and the determination to realize it at any cost. This is a force so impelling that it will bore its way through every difficulty. It is this insatiable longing and the determination to realize it that moves the world.

Original Designs in American Textiles

BY JESSE F. TURNER.

It is my belief that the cotton industry of our country has still untouched an enormous field of opportunity. Its great achievements of place and distinction makes it seem fitting that it should now reach out for the higher developments—to meet the esthetic needs. In fact, I am of the opinion that to maintain its present strong position, it must give more attention to design. It must create something distinctively its own. By that I do not mean that it should, or could, make designs wholly foreign to anything done before—for that, of course, is impossible—but it can create a national distinction. Surely, the life of our people, our manner of living, and the American tradition has a message of its own.

The Japanese, for exampe, borrowed from all races and nations, but never departed from their own national spirit. Everything they touched had a distinct Japanese feeling.

One of the most serious drawbacks to our American industry has been the copying of European designs; for copies make no appeal to the public other than cheapness. The demand is here for productions of originality, and unquestionably, the standard of taste is for better goods. It is so in laces, watches, motor cars, wines and many other industries. Does that not show us that with good taste, vision and courage of conviction a still untouched field may be developed?

In the May number last year was published an article entitled "A Little Talk About Design," in which the author approached this subject from a different angle but arrived at similar conclusions. The growing interest now being manifested induced us to publish another article last month. The speaker's argument simply adds convincing proof.

Our magazines and retail shops are keeping closely in touch with the markets of the world and are thereby keeping the public well informed, and incidentally, developing the public taste to international standard. This makes it necessary for our own industries to make exceptional strides in order to satisfy a public whose knowledge is rapidly broadening.

The cotton industry has tremendous possibilities, and its use could be dignified to far greater extent. Because it is cheap does not prevent its being beautiful, and the fact that it is within the reach of all is the strongest reason for making it so. At this time of high costs, makers of costumes are constantly in search of decorated fabrics to substitute for expensive silk. In my own establishment, I have repeatedly reached out for cottons, as a matter of choice rather than economy, but have never found in this country designs of sufficient interest for my use.

In India and Java they use cottons for dress and decoration that far surpass any silk ever produced. They have a softness of texture in cotton that produces color undeniably more esthetic than anything possible with silk.

As to the acceptance of fine decorated cottons of distinction for costumes, I have had positive proof. Last year I bought from the house of Martine in Paris, which is owned and directed by M. Poiret, who is a leading authority on design and fashion, an amount of very fine cottons designed in modern style. They were very daring and extreme both in designs and color; added to that was an excessively high cost, so that with the additional duty charge, they were quite as expensive as the finest silks. They were made up into house gowns for a prominent Fifth Avenue specialty shop, and in less than two weeks every garment had been sold. I might say with accuracy, that they were greedily seized by the patrons, whose general remarks were praise for their distinction.

I feel certain that the development of this phase of the cotton industry would result in enormous value to the manufacturers.*

The silk industry is an excellent example of what can be accomplished. In less than five years they have created a character of design sufficient to insure a domestic market of the highest kind, and to gain a more than favorable recognition and acceptance for foreign markets. Prior to the war it was believed that only France could produce art fabrics for costumes. Certain it is that in view of such accomplishments, with its greater competition in design, the cotton industry should be able to achieve more by reason of its lower cost. Publicity gained through distinction of design is very rapid and indeed profitable.

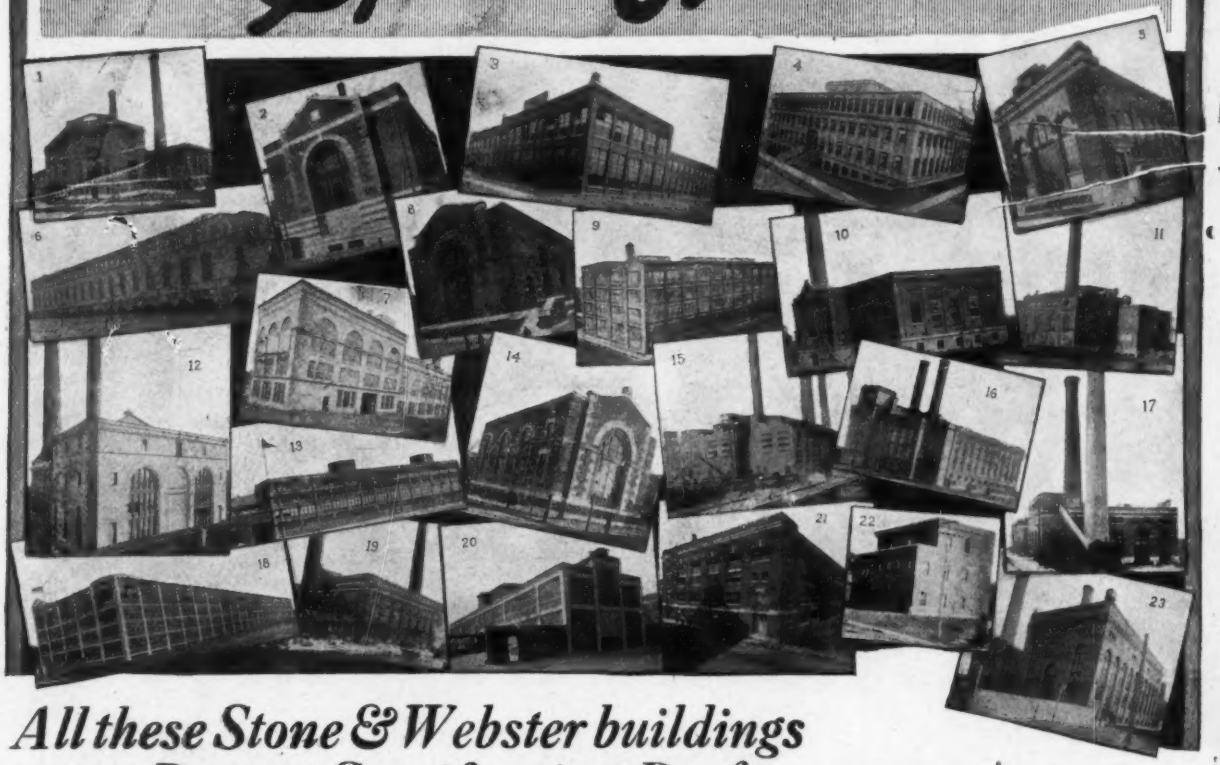
In my own establishment, where we make fine garments for indoor wear and sell to the best shops in the country, we make the workroom a combination sewing room and school. Every young woman in the establishment is encouraged to learn better design; to express her own ideas, and to give her criticism of ours. Every month she is given time from the business—with full salary paid—to visit the museums. She is encouraged to study the history of costume and the documents of all countries. She is then invited to bring in ideas to be applied to our needs. If they are bad, we tell her why; if they are applicable to our needs, we explain the reasons for their use. We then pay her for every idea that we use.

The results accomplished with this spirit and system of training have been amazing. I feel no timidity nor doubt about the development of designers. With our great museums and their storehouses of the world's creation, and the wide information of the arts and crafts of the world that is given publicity in our periodicals, combined with the general intelligence and apitude of our people, designers can and have been made to equal, if not surpass, those of Europe.

*Delivered before the National Association of Cotton Manufacturers.

Barrett Specification Roofs

Bonded for 20 and 10 Years



All these Stone & Webster buildings carry Barrett Specification Roofs—

READ this letter from the company which built the 23 buildings shown above:

STONE & WEBSTER
147 MILK ST. BOSTON

June 11, 1919.

The Barrett Company, New York

We are sending you a collection of photographs showing the types of structures on which we have used Barrett Specification Roofs. The collection includes industrial plants and buildings, warehouses, power stations, substations, office and monumental buildings, chemical works, etc., and it seems to us that this exhibit is better evidence of our satisfaction with your product than anything we might say.

Stone & Webster

For a great construction company like Stone & Webster, to use Barrett Specification Roofs is convincing proof of the correctness of the Barrett Specification principle of roof construction, and shows their absolute confidence in Barrett materials and Barrett Service.

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Making Good in Industry*

BY MARY AGNES MEYERS, R. N.

The industrial nurse has come to stay. The splendid results she has achieved are recognized by capital and labor. She has passed from the hour when her duties were limited to the first aid room. She no longer waits for sickness and accidents to occur to nurse the invalid and bind up the wounded, for the trend of the times points to preventive nursing or health nursing in industry as elsewhere.

Today the nurse is called upon to accomplish her share in making good health an asset for every employee. We hear much of the progress of industrial efficiency but the promotion of human efficiency within the factory walls rests in a large degree with the industrial nurse, for it is generally within her power to lessen the accident rate, abate many occupational hazards, relieve the strains of fatigue and monotony by improving health and contentment, and diminish the labor turn-over. If she is awake to the opportunities which present themselves, she can play a star role in the promotion of industrial efficiency; for how far can it advance without good health for its corner stone?

As a health teacher she has a field all her own, some part of the day, a recess or lunch hour, is devoted to short conferences on safety first, health hazards and allied subjects that are of equal importance and interest. She is the confident advisor of the women workers, coming as they do from all sorts of home surroundings, often with little or no knowledge of personal or sex hygiene or of venereal diseases, save what has been picked up from ignorant and misinformed companions. She finds here a large field for personal or group instruction.

By the example of her own suitable uniform, she can do much to correct extravagant and harmful styles of dress, often procured at a sacrifice of food, rest or recreation. The manner of wearing the hair receives her attention. Loose aprons, skirts and sleeves do not escape her eye during her daily rounds in the factory as flying hair or clothing may readily be drawn into the machines and painful and extensive injury result.

For the protection and comfort of the men employed in departments where poisonous materials are handled, which might cause tissue injuries or occupational diseases, the nurse endeavors to have them use protective gloves. This often demands an amount of supervision as the men cannot see its importance and offer numerous and humorous excuses to discard them, as they do with the protective goggles they are encouraged to wear in industries where grinding and chipping is done, or where painters may incur conjunctivitis from spatters of creosote or turpentine. Often by strategy the nurse can win over their prejudices and vanity, when orders from a foreman are spurned, as the spirit of chivalry in these men prompts them to obey to please the nurse.

The industrial nurse is a most important asset to the safety engineer. She is the first on the spot to investigate the causes of the accidents which come to her for first aid. She learns from these patients where safety devices have been overlooked, where danger signs are needed.

She notes unguarded machinery or hatchways, unsanitary conditions which are hazardous to health and by securing cooperation in getting these things corrected, she is able to show in her next month's report to the management a decrease in accidents and illnesses, and an increase in attendance which promotes production.

The growth and development of industrial nursing rests chiefly with those already in the field. Their successes and accomplishments must open the factory gates to qualified nurses waiting outside.

Health and accidents are controlled in many of our large factories, but all men and women cannot work in these "100 per cent perfect" plants and so those left to the small ones where a safety engineer, an industrial physician, and an industrial nurse are unknown, are exposed to many hazards. As one manager recently suggested to me, a great amount of good might be accomplished for both employer and employee if a nurse be engaged to make a daily or even weekly visit to the factories of a neighborhood, enforcing the laws of hygiene and sanitation and encouraging and educating the employees to obey them; as he said, "We might all contribute towards her salary if she made good." I hope some day to see the visiting industrial nurse working side by side with the visiting bed-side nurse, the pre-natal, the child hygiene and the tuberculosis nurses. All public health organizations have a need of her for there are corners in small factories waiting to be cleaned out by her broom, corners wherein the "full time" nurse would be too expensive a luxury.

The nurse who contemplates entering this field should take counsel with herself as to her fitness to meet and recognize the needs of industry. Progress in industry today requires in addition to hospital training, a knowledge of business relations and training or experience in social service and public health nursing in order to cooperate intelligently with local health and social agencies as a large part of industrial nursing is done outside the factory walls.

A generous supply of tact, initiative and endurance and a smile of cheer are splendid weapons to cultivate and thus prevent defeat. The nurse in industry is working alone, and there often comes a day when she feels the need of a guiding hand and the comfort of a sympathetic listener with the assurance of the needed advice to help her across the hard places. She must not overlook the interests of the employer when promoting those of the employee. She must never gossip for there is no harmless gossip, and she should always aim to keep peace and avoid being regarded as a disturber.

She was not hired to be a detective and must guard against cultivating a suspicious nature. She must give to every injured and sick employee, no matter how slight the ailment, a square deal and an understanding hearing.

She must not allow her employer to consider her a cheap substitute for a physician. She has no right to prescribe drugs or to administer them at her own discre-

*Excerpts from an address by Miss Meyers, who is industrial sanitary inspector, department of health, New York City, before a section of the National Organization for Public Health Nursing at their recent meeting in Atlanta.

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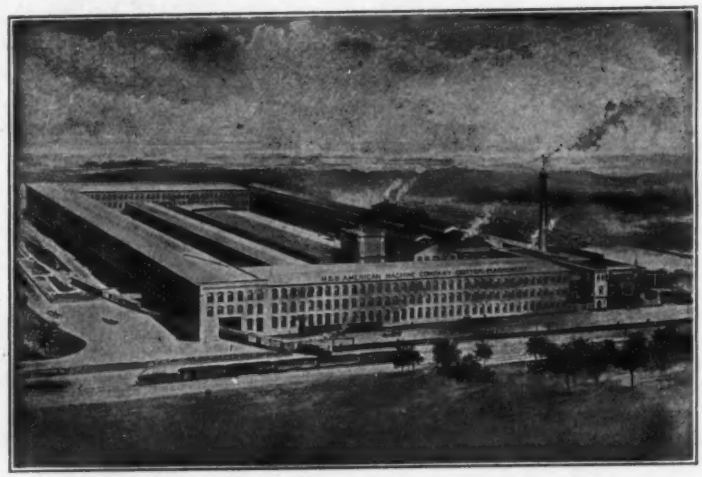

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tion to ailing employees. She must supply herself with standing orders from the doctor who attends the factory and she must carry them out in any emergency happening during his absence.

It is dangerous for her to introduce any innovation in her treatments of employees without consulting the attending physician and factory managers as they are directly responsible; she is only an agent. For example, an employee had been ordered by her private physician for anaemia hypodermic injection of arseniate of iron. He suggested the nurse at the factory might give these treatments. In good faith, the nurse proceeded to treat this employee without even consulting those in charge of the factory; perfect technique was used in these treatments but with each of these injections the patient developed an abscess. When the nurse saw the result, she refused to continue the injections and the employee, piqued, brought suit against the factory, exhibiting her abscess as a defense. Now they have a new nurse. The nurse may be very helpful in carrying out orders of private physicians if she has the consent of her employer.

There are points in industrial ethics which we only learn by our blunders and by confessing them we hope to save younger nurses from like pitfalls.

Those who have had to go into the field unequipped, and develop through experience, often expensive to themselves and their employers, will find much help and enlightenment from attendance at courses dealing with industrial problems and public health nursing matters. Familiarity with the industrial and sanitary codes and labor laws will open up a fund of knowledge, acquaintance with other industrial nurses, and with work done in plants and factories of the neighborhood or city proves an advantage and stimulus.

We all want to do the right thing but every now and then we run into some error of commission or omission that shows the need of high and uniform standards.

The contribution of the graduate nurse to industry is difficult to overestimate. Her activities have few limitations and we trust that the day is not far distant when all hospital training schools and all public health nursing schools follow the example of those medical colleges which are now offering to their students elective courses covering phases of industrial medicine. The industrial nurse must be a public health nurse. The public health nurse needs a knowledge of industry. As the demand for industrial nurses increases and their duties and opportunities widen, the need for some form of instruction on this subject is being more keenly felt and is being supplied. Those nurses already in the field will combine to raise their standards and develop a uniformity of activities.

It is by the splendid results of those who have made good that we are winning recognition from managers, yet a bit skeptical as to the value of the industrial nurse. "We cannot afford a nurse," they say to me so often, in corporations with up-to-date equipment employing hundreds of workers. By our united efforts to make good let us prove to the industrial world that the presence of the nurse in industry is a business proposition and that what an employer cannot afford is to be without an industrial nurse.

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OE-504

Social Reforms on Yangtzepoo Road

BY H. MOSELEY COLLINS.

After a thorough study of industrial problems in America, C. C. Nieh, owner of the Heng Foong Cotton Mill and employer of 1,250 operatives, three fourths of whom are women and children, returned to his native land determined to use his influence in improving the conditions of his employees. In consequence of his resolution he has not only secured better working facilities within his own mills, but also been instrumental in promoting social reforms throughout Yangtzepoo Road, a district in which thirty thousand operatives are engaged in the manufacture of cotton.

C. C. NIEH, OWNER AND HEAD OF THE HENG FOONG COTTON MILLS AT SHANGHAI, CHINA.

An American, trained in the directing of welfare work was engaged to take charge of the enterprise in the Nieh Brothers factory and straightway things began to happen. A small special building has been erected as a nursery, where mothers bring their children and leave them in the care of a woman engaged to look after them, when the parents are at work. Before this innovation, the babies had been accustomed to come to the mill, and repose in bobbin baskets beside their mothers' machines where dust and noise abounded. This practice is no longer allowed, for the health of the little one is the first consideration. In order to promote the health of the mother and the older sister as well, rest rooms have been provided, and the practice of eating lunches by the machines has been prohibited. Now the operatives are granted a half hour's nooning, when they file into the recently erected special dining hall. Here hot water to drink and to heat rice and vegetables is supplied to all who wish it. The women are no longer compelled to stand at their work but are provided with seats, which makes them much less tired at the close of their twelve hours of labor each day.

In addition to these reforms, educational facilities and supervised recreation have been offered to the employees. An enterprise which is being conducted by Nieh Brothers as well as several other cotton mills in the section is that of conducting day schools for the benefit of the children of the employees. Courses in English and arithmetic are offered to apprentices, who are required to study two hours a day, sometimes at night and sometimes during the slack part of the day.

The Nieh Bros. also provide physical training under a skilled instructor for employees, every apprentice being required to take the training three nights a week. Students who come from branch offices at some distance from the mill, are provided with carfare. Facilities for base ball, volley ball and other sports are available for those interested.

Representatives of the Interchurch World Movement, who are conducting an economic and religious survey of the orient in order to widen missionary activities, report that the work begun by Mr. Nieh has awakened other employers to undertake similar improvements. Practically every concern in the district holds itself liable to provide medical

A TYPICAL CHINESE BABY WHO SPENDS HIS TIME IN THE KINDERGARTEN WHILE HIS MOTHER IS BUSY IN THE MILL.

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THE hair-like lines of the thumb print are unalterable, changeless.

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service for its employees, most of them contributing, annually, to certain hospitals in Shanghai, in order that serious cases of illness or accident which occur during working hours may be sent there without delay. One company has a well equipped dispensary, and provides a daily clinic under a trained doctor, and almost all the firms maintain first aid boxes. Another concern through a system of fines for smoking or breaking mill rules, has provided a fund which is used to aid families in defraying the funeral expenses of employees who die in service.

Welfare work among cotton manufacturers has also proved an impetus to the development of the Yangtzepoo Social Center, which occupies the exact center of the district and is the one agency committed to social and industrial betterment. This Center is conducted in connection with the department of sociology of Shanghai College and has as its director the head of the department.

Day and night play are possible at the Yangtzepoo Playground, which is located next to the Center, for electric light is provided after the sun goes down. This enables workers from the shop, who can come only at night, to take advantage of special instruction in physical training and coaching for games and sports.

Dramatics and musicals are furnished by the department of esthetics, the best talent from Shanghai College being utilized to stimulate an interest in the arts among mill operatives. Moving pictures, which are shown free of charge, also serve as promoters of education and recreation. The department of research conducts surveys of the district to determine housing conditions, distribution of population, health, literacy, and family life. It has also made investigations as to wages, hours of labor, welfare efforts in the mills and the causes of strikes. Sunday school and church services are held under the direction

A VIEW IN THE HENG FOONG MILLS SHOWING THE ARRANGEMENT OF SEATS FOR THE OPERATIVES AT THE END OF THE FLY FRAMES.

The committee of development is made up of one foreign and three Chinese cotton mill managers and one lawyer. The work of the Center is divided into five departments, education, play, religious work, esthetcs and research, each under the direction of leaders, who are responsible to committees in charge of the departments. Citizenship is taught in the boys' school and the girls learn to sew, knit and cook, in addition to their regular studies. A reading room, where daily papers and periodicals are available, and a library for public use, is also maintained. Recently a baby welfare exhibit was held, which was attended by four thousand people and at which charts were shown and explained by boys and girls.

of the religious work department, and evangelistic parties are organized for street preaching.

Mr. Nieh in discussing China's industrial problem with an Interchurch worker declared that the Chinese laborer has always been used like an animal, has been underpaid and consequently poorly nourished. Until China follows America's method of protecting the working man by means of legislation, he will continue to be subject to the good will of his employer. However, the progress of the welfare work undertaken by cotton manufacturers in Shanghai and the spirit of cooperation which now exists between them and the Yangtzepoo Social Center, is a long step forward in the right direction.

Notes About Men You Know.

GEO. S. HARRIS.

GEORGE S. HARRIS has been elected president and general manager of the Exposition Cotton Mills, Atlanta, Ga. This was decided at a recent meeting of the board of directors of the company, of which Mr. Harris also becomes a member. Mr. Harris goes to the Exposition Mills from West Point, Ga., where he has been since 1907 as superintendent of the Lanett Cotton Mills, agent of the Lanett Bleachery & Dye Works and a director in both companies. He was superintenlent of the Gate City Cotton Mills, Atlanta, for two years previous to going to West Point. He was also at the Sycamore (Ala.) Mills for three years and is a graduate of the Lowell Textile School.

The appointment of Mr. Harris as the active head of the Exposition Mills, which comprise one of the leading and more progressive organizations in the southern textile field, is well-merited and his many friends in and out of the industry wish him success in his new location. He succeeds Edw. H. Inman as president, and also becomes general manager, succeeding Stoney Drake, who recently resigned this position, in conjunction with that of vice-president, to enter the manufacturing field for himself. Details as to his new enterprise have not yet been given out by Mr. Drake.

R. W. JENNINGS, for many years connected with the Lanett Cotton Mill, has been appointed superintendent in the place of George S. Harris, resigned. Mr. Jennings will retain as his assistant John H. Howarth, who has been assistant superintendent under Mr. Harris for several years.

LAFAYETTE LANIER, agent of the West Point Manufacturing Co., also becomes agent for the Lanett Cotton Mills at West Point.

GARNETT ANDREWS, president of the Richmond Hosiery Mills, Rossville, Ga., and a well known member of the southern knitting industry, sailed on April 24, on the S.S. Mauretania to be gone until about the latter part of July on business in Europe, where he will visit his company's export trade and customers, and agents, and try to get a summary of business conditions as they affect the hosiery market from the other side.

W. H. HARTLEY, formerly connected with the Unity Spinning Mills, LaGrange, Ga., has accepted a position as general overseer of spinning, spooling and twisting at the Hogansville (Ga.) Mfg. Co., Division of the International Cotton Mills.

VANCE MCCARTY, general sales manager of Edw. R. Ladew Co., Inc., manufacturers of Ladew leather belting, has been made vice-president of the company. Mr. McCarty's connection with this company covers the past 20 years and embraces every phase of the leather belting business, including manufacture, sale, branch management and general sales direction. He will continue in direct control of Ladew sales policies, and has retained as assistant general sales manager Russell B. Reid, another belting expert with 20 years of leather belting experience.

G. W. PAXTON has resigned as overseer of bleaching at the French Broad Manufacturing Co., and accepted the position of overseer of dyeing at the Carhartt Mills, Rock Hill, S. C.

C. R. EVANS, formerly overseer of the cloth room at the Thrift Manufacturing Co., Paw Creek, N. C., has been made overseer of the cloth room at the Whitney Mills, Spartanburg, S. C.

J. T. REEVES has become overseer of carding at the Ensign Mills, Forsyth, Ga. He was formerly connected with the Dixie Cotton Mills, LaGrange, Ga.

F. L. BRANSON has resigned as superintendent of the Fairfax (Ala.) Mill to accept a position with the Consolidated Textile Corporation.

C. A. SWEET, formerly superintendent of the Swift Manufacturing Co., Columbus, Ga., has become superintendent of the Fairfax Mill succeeding Mr. Branson.

S. P. FENN, vice-president and treasurer of the Sherwin-Williams Company, Cleveland, Ohio, on April 1 completed fifty years of active work with that organization. The occasion was fittingly celebrated by his associates in business with a banquet which was attended by 350 members of the organization. Mr. Fenn was employed as cashier and bookkeeper by the firm four years after its organization in 1866 in Cleveland. He has since been an active worker and supporter of all the activities of the company, and it has been partly through his untiring efforts that it has grown into one of the larger manufacturing concerns of the country having manufacturing properties in a number of cities of this country and others in Canada, England and Australia.

H. C. MCNAMARA has accepted a position with the Southern States Supply Co., of Atlanta, representing Isko refrigerating equipment in the southern textile field.

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The Warren
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Will Place on the Market a Complete Line of

SOFTENERS, SIZINGS, AND FINISHING COMPOUNDS

In addition to the well known brand of TEXTILE SOAPS
Our representative will call in person on every mill
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NEWPORT COLORS

"COAL TO DYESTUFF"

From this time forward, whenever Newport colors are advertised, t,here will appear the slogan, "Coal to Dyestuff."

This is not an idle phrase—on the contrary it bears a message of the utmost importance to every dyestuff consumer the world over. In three words it epitomizes the following pregnant facts:

1. The Newport organization owns its own coal mines.
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3. It makes its own coke from its own coal in its own by-product ovens.
4. It distills its own crudes from its own coal tar.
5. It develops its own intermediates from its own crudes.
6. It manufactures its own dyestuffs from its own intermediates.

In sum, the "Newport" is the *only manufacturer* of dyestuffs in America which *owns and controls every step* in prouedtion from the time the coal leaves the mine till the finished product is shipped.

This happy condition means to us a uniform and assured supply of raw materials, and a single great organization to handle every manufacturing process. To consumers it means that we have no one with whom to divide responsibility—that we must stand squarely behind every Newport product. Is it any wonder that *Newport Dyestuffs are Standard?*

When you see our slogan, remember what it means:

"COAL TO DYESTUFF"—NEWPORT ALL THE WAY

Newport Chemical Works, Inc.

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BOSTON, MASS. PHILADELPHIA, PA.
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ALBERT GASTONGUAY, for the past four years agent of the Le Roy division of the Bay State Cotton Corporation, at Le Roy, N. Y., has been transferred to the Lisbon division of the same company. Before leaving the former plant, he was presented with a traveling bag, smoking and shaving set by the overseers and employees. He succeeds William Worsnop at the Lisbon plant, who goes to the Cabot Manufacturing Co., Brunswick, Maine, to take the position of agent formerly held by Russell W. Eaton.

THOMAS J. FEENEY succeeds Mr. Gastonguay as agent of the Le Roy division of the Bay State Cotton Corporation.

W. L. BEYER has resigned as treasurer and manager of the Cochran (Ga.) Mills.

E. L. SKIPPER, formerly assistant superintendent of the Lancaster (S. C.) Cotton Mills, is now superintendent of the Kershaw (S. C.) Cotton Mills.

C. S. SCOTT has been promoted from night to day overseer of weaving at the Inverness Mill, Winston-Salem, N. C., succeeding L. R. Wilson, resigned.

ARTHUR K. STEWART has been appointed assistant superintendent of the Lonsdale (R. I.) branch of the Lonsdale Company.

J. H. HADDOCK, for several years superintendent of the Stonewall (Miss.) Cotton Mills, has been made assistant efficiency engineer of the Erwin Cotton Mills Company, Durham, N. C.

FELIX MOSELEY has accepted the position of overseer of weaving at night at the Fidelity Manufacturing Co., Charlotte, N. C.

C. DIAMOND has resigned as engineer and electrician at the Crystal Springs Bleachery Company, Chickamauga, Ga.

R. A. HUBBARD has resigned as superintendent of the Belton (Texas) Cotton Mills.

JOE MANSFIELD has been made superintendent of motive power at the Crystal Springs Bleachery Company, Chickamauga, Ga. He was formerly connected with the government pumping station at Ft. Oglethorpe.

ROBERT W. GRAY, pioneer cotton mill man of Gastonia, N. C., died recently after a lingering illness. In connection with his brother, the late Geo. A. Gray, Mr. Gray helped organize and build the Gastonia Manufacturing Company, one of the first cotton mills in Gaston county. For a number of years he was superintendent of this mill. Upon the organization of the Gray Manufacturing Company, Mr. Gray went to this mill and was actively associated there until forced by failing health to relinquish his duties.

B. L. AMICK, superintendent of the Franklin Cotton Mills, Concord, N. C., has resigned and been engaged in a similar capacity at the Cherokee Falls (S. C.) Manufacturing Co.

J. A. SHIPES has resigned as overseer of spinning at the Fidelity Mills, Charlotte, N. C.

C. O. EDWARDS has been appointed superintendent of the Alexander City (Ala.) Cotton Mills. He was for six years overseer of weaving at the Avondale Mills, Sylacauga, Ala.

WM. D. ANDERSON has resigned as assistant treasurer of the Loray Mills, Gastonia, N. C.

J. E. OWENS has been appointed superintendent of the Liberty Cotton Mills, Dallas, Ga.

How Other Men Manage

Practical Discussions by Cotton's Readers on all varieties of Mill Subjects

The Winners in the Prize Contest.

The winners in the prize contest are as follows:

First Prize, $20.00, George D. Simpkins, Sr., General Overseer of Spinning, Bibb Manufacturing Company, No. 1 East Macon, Ga. Contest Letter No. 51.

Second Prize, $10.00, D. C. Shainline, Superintendent, Des Moines Hosiery Mills, Des Moines, Iowa. Contest Letter No. 35.

Operating Two Shifts.

EDITOR COTTON:

Is it a good policy for southern cotton mills to operate day and night shifts?

Never before in the history of the industry have cotton mills been confronted with such a scarcity of labor. Never before have they operated on such a low basis of efficiency. The labor turn-over everywhere has never been so large.

Immigration figures for the current year show that whereas before the war we had one million immigrants yearly to supplement our labor supply, we now have a movement in the other direction, that is, more foreigners are returning to Europe than are admitted through Ellis Island. This is having its effect on all industries and particularly those textile centers of New England which have for years been operated almost entirely by foreign labor. This shortage will cause New England mills to turn toward the South for labor and their strongest point will be higher wages and shorter hours. Will southern cotton mill labor be induced to move? Probably not, but the knowledge that higher wages and shorter hours are being granted by the mills of the North will not tend to quiet the restlessness that is so prevalent among them.

We have in the South ample labor to operate all of our mills running the usual number of hours per week. And the normal yearly increase of labor will take care of all new mills and additions. But we haven't enough labor for all mills to operate two shifts, and those mills attempting to do so are disorganizing the whole industry. The night operatives are paid from 10 to 15 per cent more than those working during the day and in most cases the total hours of the night shift are shorter than those of the day. No one can truthfully claim that the night production by the hour ever equals that of the day. But that is not deterring many mills from night work. In order to get help for their night run they are bidding higher and higher, and labor in turn, is giving less per hour in return and demanding more money for the smaller amount of effort given. There seems to be no limit to the expansion along these unhealthy lines.

This "pyramiding" in wages paid to labor and labor "pyramiding" in inefficiency is certain to bring violent differences between mill owners and their employees when we turn about and start back to normal or even relatively normal conditions. It's easy to raise wages and shorten the working day but to accomplish the converse is quite another matter. And the farther we go in the first direction the more difficult will be the latter. Nobody expects the present wage scale to be maintained permanently. What we should prepare for is to see that the deflation in wages when it does come is not brought about in such a way as to create friction between employer and employee. This is going to be more and more difficult as wages mount higher. The total family income of many mill families is in the neighborhood of $5,000 yearly. Are they going to give up that income and the standard of spending which such an income has given them without objection?

No one can deny that the profits accruing to mills are very liberal whether they operate one shift or two, or 54, 55 or 60 hours per week. Under such circumstances why should the Berkshire strain common in all lead us to extremes in the mad race to make more and more money. If all mills would be content with their day run, there would be of course less total production, but that would be compensated for by better prices. There would be ample help for all mills. The production per spindle could be increased. There would be less idle machinery. Supply bills and actual depreciation figures would be lower. Moving from mill to mill by the operatives would be reduced. And finally the vein of prosperity which all mills are today enjoying would not so soon be exhausted.

A Superintendent. (Ga.)

More Answers to Card Grinding Questions.

EDITOR COTTON:

I noticed in the February number of COTTON that "Night Overseer, (Mass.)" would like some questions on card grinding answered and I submit the following answers with the hope that they will be of assistance.

When a card is re-clothed, a certain number of flats must be removed. The new clothing is higher than the old clothing, or should be higher. Therefore the flats should be raised at every setting point.

After re-clothing the card, the dead roll should be used on the cylinder and the traverse grinder on the doffer. The dead roll, having a larger grinding surface than that of the traverse grinder, will smooth the surface of the cylinder in a shorter time, but the traverse grinder should be used after the cylinder is smooth enough and should not be disturbed for a couple of days at the least. As a rule, the wire on the doffer is too fine to receive the severe treatment of the dead roll.

It is a bad practice to run the flats while a card is grinding, especially in a large room where so much handling of the stock is necessary. For instance, let us suppose that the flats are run while a card is grinding. A stripper may be carrying a lap, or removing the fly or strips, and

some of this matter fall on the flats of the card that is grinding. As the cylinder is running in a direction opposite to that of carding it will roll the stock under the flats and in a short time will form hard lump which will result in a fire. Even the dirt and foreign matter found between the flats is enough to cause a fire. That is the only objection that I know of to running the flats while a card is grinding.

In starting a new mill with no stock in the room I would grind all together. But as a rule, even in starting a new mill, the doffer and cylinder are ground first. The flats are evened and ground on a grinder.

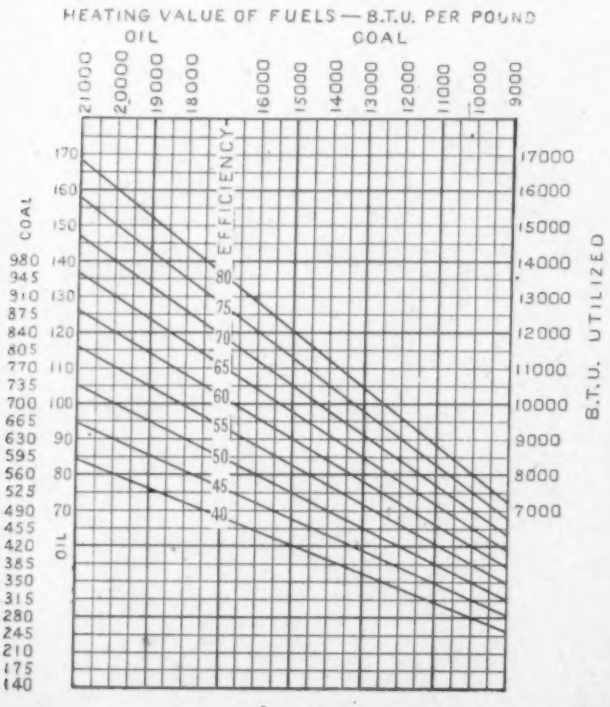
Wash (Conn.)

A Chart for Finding the Amount of Fuel Oil Required Under Certain Known Conditions.

EDITOR COTTON:

The accompanying chart is intended more especially for the larger plants in which the actual efficiencies of boiler and furnace are fairly well known. It indicates in the right hand margin the number of British thermal units, (B.t.u.) utilized when the coal or oil is burned with a given efficiency, and in the left hand margin two columns of values by means of which the number of barrels of oil corresponding to one ton of coal may be obtained. One barrel represents 41 gallons. Then, having the price of coal per ton, the corresponding price of oil per barrel is found by dividing the price of coal by the number of barrels of oil.

Assume coal is being used, the heating value per pound being 14,000 B.t.u., and that the coal is being burned with an efficiency of 60 per cent. It is intended to change to oil fuel having a heating value of 18,500 B.t.u. per pound. If the oil can be burned with an efficiency of 65 per cent how many barrels will equal a ton of coal, and how much should be paid for the oil per barrel?



First, find the B.t.u. per pound of coal, 14,000 B.t.u. Follow this vertical line downward to the 60 per cent efficiency diagonal, thence horizontally to the outer column of figures in the left hand margin where the value 595 is read. Second, find the B.t.u. per pound of oil, 18,500 B.t.u. Follow this line downward to the 65 per cent diagonal line, thence horizontally to the inside column of figures in the left hand margin where 120 is read. Divide the value in the outer column by the value in the inner column; the quotient is the number of barrels. Thus $595 \div 120 = 4.95$ barrels of oil will correspond to a ton of coal under the conditions of heating value and efficiency previously indicated.

If the coal costs $7.80 per ton, the highest price that should be paid for oil is $7.80 \div 4.95 = 1.58$ or $1.58 per barrel of 41 gallons. This price does not take into account any saving of labor or of ash disposal when burning oil, which saving if credited to the oil, or charged against the coal, would permit a slightly higher price to be paid for oil before the cost with oil equals the cost with coal. To find this higher price of oil, divide the total saving effected by the oil, by the number of tons of coal burned in the same length of time, as per day or week as the case may be, and add the quotient to the price of coal. Then divide by the number of barrels of oil as before.

The chart is also useful in an oil-burning plant, for should the price of oil advance and the price of coal decline, it would be desirable to know when the cost with the two fuels would be the same. In this case find the number of barrels of oil corresponding to one ton of coal, in the manner previously described. Multiply this number of barrels by the advanced price of oil; the product will be the price of coal at which the costs would be the same. Therefore, if the price of coal were likely to remain there it would be profitable to discontinue the use of oil.

H. K. (Ohio)

Watch Beater Pins and Licker-in Points.

EDITOR COTTON:

What part does the pin-beater on a finishing picker, and the licker-in on a card play in the production of good work?

A pin-beater, with all its pin spikes, is counted upon to tear up the cotton and in doing so to spread it evenly upon the screen. The draw rolls on the front, pressing it smoothly, rush it onto the calender rolls, etc.

Now, let us see what it means to let the pins in the beater get damaged. The damaged spikes are bound to get bent over and this makes a hook on the pins and as the beater makes its revolutions, the cotton will get hooked onto the crooked points of the pins and will be carried around the beater several times, collecting a greater amount of cotton until it is blown off. Then it is thrown onto the screen in a lump. But while it is doing this, it is interfering with the regular flow of cotton which is being thrown straight on as it goes to the screens, thus making a certain amount of thin places, while the lump from the pins, when it comes, will make a thick place and therefore the more bent pins the more thick and thin places there will be in the work.

The pins on the finishing beater should be watched very closely, and as they get damaged the lags should be taken off and the pins renewed. When the beater lags are worked over there will be found some lags which cannot be used again, the pins being damaged so that new ones will have

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to be ordered to replace them, when there is more than one; and even then it would be best to put new lags on all the arms in order to make them balance better, retaining the old ones from which to draw undamaged pins for use in repairing the lesser damaged lags being taken care of.

When worked over a beater should be tested to make sure that it is well balanced to take care of the beater box, for running unbalanced beaters will soon result in wornout beater boxes.

Beaters can be very easily tested in the following manner. Take two work horses, level them and put a round rod on top of the horses; put the beater journals on the rods of each horse, thus placing the beater between the horses so that the heavy side will swing downward. Then take off the casing on the top lags and add in the weights for balancing; keep this up until all the lags are so balanced that the beater will stop at any place when rolled around. The beater should be given a thorough test in this way.

The finisher picker is one place to save the licker-in by setting the knock-off motion so that when extra lumps come up they will not go through the calender rolls, especially any hard metal materials, as these will bend the wire points on the licker-in, and a bent point can never be made as good as it was before it was bent.

The point on a licker-in is of very fine caliber, and is as important as it is fine, for every point has a part to play. The point on a card cylinder wire is very much finer, so still more care must be taken to see that the cotton is laid on the cylinder as smoothly as is possible as every lump or thin place is bound to have its effect on the evenness of the slivers; the thick place is drawn out and made a longer thick place and the thin place is also made longer. It is a small thing, but it is usually the smaller things that cause the most trouble as the larger ones can be seen more easily.

I remember running a card room once that was apparently making the best stock that I had ever seen, but the yarn in the spinning was very uneven; I hunted every place imaginable to find the cause but was unsuccessful until one day I chanced to pass a card grinder who was cleaning a licker-in and gauging up the card backs, when I saw a lot of wires in bad condition. I began working them over and watching the effects. Some I had to have rewound but some I could straighten up and file smoothly so that the cotton would not hang to the points of the wires on the licker-ins.

Crooked points on the licker-in will have the same effect on the quality of the stock as crooked points on the pin beaters, only the former are finer. Let some of them get bent down all around and notice the flakes that will come off and be carried to the cylinder to be later doffed off on the doffer. The stock will have a very cloudy appearance as the fibers will be ground up into fine bits.

The card grinder should keep the overseer posted about all defects that he finds have happened between grindings. A lot of things will cause the wires to get damaged such as mischievous chaps throwing nails, buckles, rings off quills and bobbins and a lot of other things that could be mentioned. Licker-in wires are not going to get damaged by themselves, they will get dull by the constant wear of the cotton but that is all.

As the licker-in gets dull the mote knives should be given more "pitch" to help the licker-in in cleaning the work. There is no established rule by which the mote knives may

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be set; this all depends upon the condition of the sharpness of the licker-in, but it can be readily found by setting and watching its effects, then vice versa, to suit the good and bad droppings of waste underneath the back of the cards.

Of course the rest of the card has to be set in proportion but the licker-in plays a very important part and should be set smoothly in line with its contacting points. Revolve it, and regauge it, being sure it is set evenly all the way across the gauging points, and do not run the belts too tight on either end of the licker-in.

T. A. D. (Ga.)

Making 28s Single Carded Hosiery Yarns.

EDITOR COTTON:

When I undertake to write an article on the manufacture of cotton yarn I realize that it is a "man's job" so I will not try to write one, but will try to give to the readers of this department a few of the things that have helped me, some of which it has taken years to thrash out. Please understand that even then what I do not know would make a big book, so if any of the readers have anything helpful I would be glad if they would pass it this way.

The things which I will mention have been tried out in five different mills, the one in which they did the most good being a mill on number 28s, high grade single carded hosiery yarn. I will not give the name of the mill, but it is still running and getting production and good quality and we are not having any kicks on the product.

The best grade of cotton to use depends upon the quality of yarn desired but should not be lower than strict middling 1-inch staple; 1 1/16-inch would be better if quality and quantity are wanted as the shorter the cotton the more the twist which will be necessary to give the proper tensile strength and as the production is governed by the front roll speed, every time a turn of twist is put in, the speed of the front roll is cut just that much. We buy strict middling 1-inch, every bale of which is stapled, all short or long cotton being turned down and sent back.

Every mill should have a good warehouse to take care of their cotton—one with a good floor and platform on which to unload the cotton. Bales of cotton should never be set on the ground. If a warehouse hasn't a floor, some timbers should be procured to set the bales on.

When the cotton comes in it should be gone through by someone who knows the different grades. He should take a good sized sample from each side being careful not to get any bagging stain. He should then take a card or piece of paper upon which the number of the bale has been marked and put it between the two samples from each side and roll it up. Then the ends should be bored with a good cotton auger and a sample saved from each end as near the center as possible. This will give the quality of the cotton all through, as some times it is false packed at the gin. To test the length of staple a small bunch should be grasped with both hands and pulled apart; then one bunch should be taken in the left hand and several small tufts pulled from the end of the bunch with the fore finger and thumb. This should be worked down by pulling it out by catching the fibers that project with the same finger and thumb until the fibers are all lying parallel, note being taken of the amount of waste which has to be thrown away. That which has been straightened out should be laid on some dark surface and measured with a rule. In this way, with a little practice, the length of staple can be determined. After the cotton is carried into the mill to be mixed the carder should go through it again, for if one bale of short staple should get mixed in it will play havoc with the quality and production, and on the other hand, if the machines are set for 1-inch and get 1⅛-inch, the result will be cockled yarn.

We open six bales at a mixing and although this is not enough it is all we have room for, due to the smallness of the mixing room. We take the bagging and ties off these six bales and take a small layer off number one, tear it up well and scatter it over the entire space. We do the same with number two, etc., until we have mixed some from each bale. Then we start back to number one again and go through once more until all six bales are well mixed. Then the opener man takes off a layer from the top down to the floor; this gives some of each bale in every armful. All damaged ends that are found are taken out and baled up with the bagging and pickings.

We keep all the aprons in good shape and run a 12-ounce breaker lap and have doubled the speed of the feed rolls and apron where the cotton is fed to the three-blade beater (a double beater Kitson machine). The beater is set to within ¼-inch of the feed roll and is kept sharp, a rough edge after sharpening being avoided. To prevent this they are gone over with a fine file and emery cloth.

In running on 1-inch cotton the exact settings of the three blade beater should be ¼-inch from the face of the feed roll and ¾-inch from the grate bars at a speed of 900 r. p. m. With similar stock the settings of the two blade beater should be ¼-inch from the face of the feed roll and ⅝-inch from the grate bar. This should have a speed of 1,100 r. p. m. It is evident that these settings are too close unless the speed of the feed rolls and the short apron back of the three blade beater, where the cotton is fed from the hopper, has been doubled from what they were when they came from the shop; that is, the machine must have a very light feed. In other words, the feeding is light and fast, which will not affect production. The settings for the three blade Kershner or carding beater should be ¼-inch from the face of the feed roll to the points of the teeth of the beater and 7/16-inch from the grate bars, with a speed of 1,025 r. p. m.

In balancing Kershner beaters they should be placed on two benches or carpenter's saw-horses. Two good smooth speeder spindles should first be fastened on top of the benches by driving two nails at each end and bending them over. Then the benches should be leveled lengthwise and the beater put on them with the shaft resting with each end on the spindles. Next, the shaft should be leveled, that is, the horses should be raised or lowered until the shaft is level.

Then the blades should be numbered 1, 2 and 3; 3 is turned on top, leaving 1 and 2 on each side. If one of these is the heavier, the beater will turn putting the heavier one at the bottom, showing that the lighter one needs to be brought up to the other in weight. Enough putty should be stuck on the lighter blade to make the beater stay at any point desired. Then, after each blade

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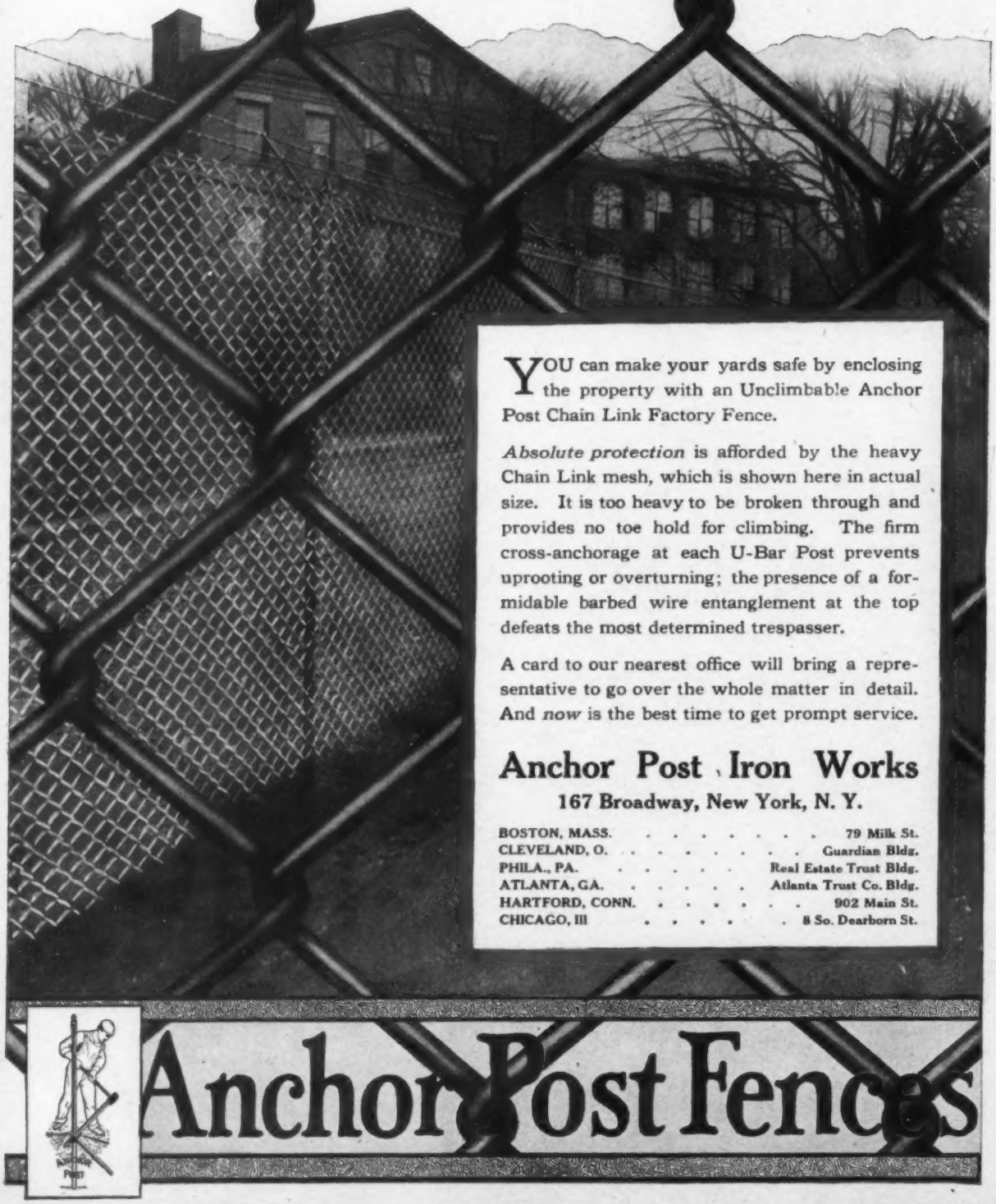

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has been tested out on each quarter, the putty should be taken off and weighed apart from each blade, care being taken not to get the separate weights mixed. Next, some lead should be hammered out into a thin sheet and cut off until it is of the same weight as the putty. These pieces of lead should be tacked on each blade on the under side of the lag in place of the putty. In this way the beater can be made to balance perfectly. This should be done every time new lags are put on the beaters as they do not all come from the shop weighing the same.

All the screens should be repaired and the leather trimmed good and smooth, which gives a good smooth selvage to the laps.

The fan speeds of the double beater machine on the back sections of the three blade should be 900 r. p. m.; for the two blade beater, 400 r. p. m.; on the finisher three blade carding beater the speed should be 1,000 r. p. m.

The weight of the laps depends upon the amount of pickers, but should be as light as possible and a draft over 4½ should never be tried; a 12-ounce breaker lap will work fine if it is possible to make this and keep up on the intermediate or in case the double beater machine is used, to take the stock direct from here to the finisher.

To adjust the evener, the belt should be set in the center of the cones, that is, just half way between the large and small ends of the cones. A lap should be run with the belt set this way and an average secured of the weight of lap made. This average can be secured as follows: If the machine is making a 13-ounce lap and a 12-ounce lap is desired and a 32 draft gear is being used: $12 \times 32 \div 13 = 29$ draft gear which will give a 12-ounce lap. The intermediate laps should be made the right weight to keep the belt as near the center of the cones as possible.

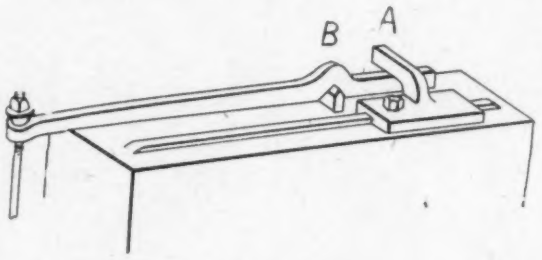
The weight that operates the evener should be taken off, that is, the one that moves the belt to the small end of the cone, and a piece of rope or leather long enough to reach under the floor fastened to it. A hole should be bored through the floor directly in line with the face of the disk to which the leather strap is fastened and the weight tied under the floor. This removes the danger of the weight striking the side shaft and will give a more even lap. Then the evener should be adjusted until it gives the right weight and three or four laps that weigh right made, a record being kept of the weights, with four laps up on the apron.

One of the laps is now taken off and three used, a record being kept of the weights, and if it shows light or heavy, the machine is not set right. If it is heavy, A should be moved closer to B (see illustration) and if too light, A should be moved farther from B. There is no set rule for this as it must be governed by the quality of the cotton; if the cotton lays closer it will have to be different from what it would be if the cotton was spongy.

This ought to be done every few weeks so that a lap with three can be made at any time. If this is possible, when the finisher man lets one of his laps run out it will not cause it to be the wrong weight. A lap that weighs over a quarter of a pound off either way should not be allowed to go to the card room and it is not a good policy to always take the finisher man's word for it; it is better to drop in every few days in person and see that the weight of the laps is all right.

The machines should be gone over and all worn gears and studs replaced with new ones, for if the screens or rolls run in a jerk, it will cause thick and thin places and if this is allowed and the cards are drafting 100, the reader can easily see what will eventually be the result. A good way to handle the feed rolls, if the bearings are worn, is to take them out and turn the bearings up. Then the boxes should be rebabbited. This will give a good tight bearing, it may also be necessary to scrape out the boxes a little in order to get a running bearing.

All oil and grease should be wiped off the outside of the machine twice daily and the motes taken out each day. The bonnets should be raised twice a day and all grease and dirt wiped from the beater trunk. All chokes around the screens should be taken out and the blades of all the beaters wiped off good and clean. Twice a day the bonnet over the screens and all accumulation of fly



around the front and back of the screen should be taken out. The machine should be gone over once a week and all oil holes cleaned out.

The floor should be swept once an hour each day and cotton should not be allowed to get scattered over the floor, for if there is a fire this will cause it to spread over the entire room. The corners should be watched and accumulations of waste prohibited. All bale buckles, etc., should be watched out for on the floor as sometimes they will cause serious breakdowns and fires. And above all things, good scales should be secured on which to weigh the laps.

The screens, calenders and feed rolls ought to be taken out, say, once every three months and cleaned thoroughly. The fan speed should be kept sufficient to pull the cotton regularly in a straight line to the screens; this speed will of course depend upon the height of the flue but should be about as previously mentioned.

Oiling should be carefully watched—too much oil should not be used in the beater boxes for too much here is almost as bad as too little. If enough oil is put in so that it runs out in the machine and gets in the cotton, all the tapers on the cards will soon loosen up at the foundation.

There is one important thing which I should have mentioned in the beginning. In the mixing of waste with good stock, some kind of a waste machine to work this through should be used. But if such a machine is not used (and there are a lot of mills in this fix), the two laps in the middle should be taken off, that is, the front and back should be left on the intermediate, or on the finisher if a carding beater is not used in the intermediate for the blade beater is likely to damage the staple. The waste should be fed by hand, care being taken to scatter it well on the back lap, and the stock will come in between the two laps which will enable it to go through the feed

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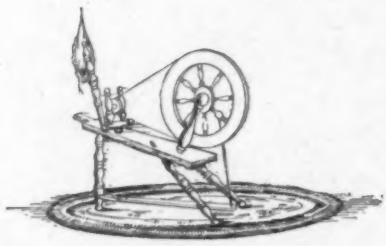

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roll. It should be allowed to run off in front on the floor and then be taken up, shaken up and mixed well with the cotton, care being taken not to get too much in one place—it should then be equally distributed throughout the mixing. I suggest this for roving waste and spinning laps.

I have had in mind, so far, the Kitson picker. I will now offer a little plan that will probably help mills using Atherton machines. The large 90-tooth worm gear that drives the feed rolls is single threaded and to increase the feed roll speed, especially when running on coarse work, trouble will be experienced with the bearings burning out on the cones. Therefore, I suggest that a double threaded worm be made; a 90-tooth gear should also be made to go with it as the double worm gear teeth will have a different angle. When the double threaded worm is put on, it will double the speed of the feed rolls; therefore, the gear on the side shaft should be changed and the speed of the cones cut down to just one half. This will give the same feed roll speed. I have made no sketches for illustrations as it is a very simple matter to make this change.

Now just a few words about belts. Care should be taken to have a good endless evener belt and this should be just tight enough to pull the cone without slipping. The beater belt should also be endless. This belt should not be allowed to slip for if it does it is almost impossible to get an even lap.

CARDS.

We now come to the cards. Here and in the picker rooms is where the foundation for a good yarn is laid. If these two departments are at fault, things will go wrong all the way through the mill. I think the greatest trouble with a lot of carders is that they are "pound foolish or speed crazy" for speed does not always get production. If the cards are run at such a high speed as to make it impossible for the help to keep the ends up, more cotton will go on the floor than into the cans. I think that this crowding of cards has caused more expense in mills than any other one thing. I once asked an Englishman why it was that American mills could not compete with English mills and he told me that the main reason, he thought, was that the mills in America, or at least a large part of them, had just about half as many cards as were necessary. This man has been superintendent of mills in both this country and England.

The point I am trying to make is that all the cards should be run all the time possible and should be set to card as lightly as possible. The cylinders should not be run over 165 r. p. m. but should at least make this speed. All belts on the cards, especially the licker-in and main drive belts, should be watched. It is a good plan to take an indicator and go through the card room every day or so; it will be a surprise to see the loss figure this means when the production reaches the spinning. The cards should be speeded to take care of it or, if possible, run through the noon period, then the speed can be cut about 10 per cent for the hour that is taken off from the other machines for dinner.

Cards should not be allowed to get to the point where they have to be ground to sharpen them, but should be ground to keep them sharp. In other words, they should never be allowed to get dull. Above all things, the top flats should not drag over the front and back plates. Every time the flats are set, a gauge should be tried between them and the plates to see that they do not touch. If the chains are worn it should be taken up wi h the machine builders. Most of them make a special sprocket and disk which will positively take the slack out of the chain and thereby give several more years of service and chains fixed in this manner will answer the purpose just about as well as new chains.

On 1-inch stock the cards are set as follows: flat, .010 on the back and .009 on the front; the first three stands from the front doffer set to .007, the feed plate to .012, top mo.e knife to .007, licker-in to cylinder to .007 and the main screen set on the back to .012, set in the center to a full four leaf gauge and on the front to two full four leaf gauges.

The speed of the licker-in should be 420 r. p. m. and the card sliver should weigh 48 grains per yard, giving a production of 85 pounds per day of 10 hours. The card wire should be 110 on the doffers, 100 on the cylinder and 110 on the top flats.

The screens should be taken out about once a year and cleaned thoroughly. A good grade of graphite should be used and enough water mixed with it to make a paste which should be rubbed over the screens. It should remain until dry and then be brushed off; this will leave the screens with a good polish on them.

Now as to oiling, I have seen some cards that have been ruined by lack of sufficient oiling and others ruined from getting too much oil. A good way to manage the oiling of the comb boxes is to make a measure of a size which seems to hold sufficient oil and to try it out. The boxes should be watched closely and if the measure does not hold enough oil it should be made larger; and if too much, it should be cut down some. I find that about once a week is often enough to oil if a proper lubricant such as a soft grease is used, but this can, of course, be determined by experience.

There are some things about the cards that must be watched very carefully. The laps should not be allowed to run out so as to let the doubled end go through where the finisher man wound the lap around the lap pin, for this will disturb the settings and injure the wire in the foundation; on the other hand, the laps should be watched and the double end pulled off.

The cards should be stripped often enough to keep the cylinders from loading on the grade of work in question. I find that to do this three times in ten hours gives good results, but if as much as 100 pounds per day are being carded. I would advise stripping four times. If the old style stripping roll is used, the ends should be watched and not allowed to get "bunged up" and, when clothing the roller, a good plan is not to wind it spirally around the roll but to wind it straight. This will necessitate tacking and cutting it off every round and will take longer but such time is well spent as a roller clothed in this way will not run or push the cylinder and doffer fillets to one end, which is usually the case with one wound spirally, especially when it is set a little deep. But they should be watched and not allowed to get too deep, whether wound spirally or not, for an easy way to ruin a lot of clothing is by tearing up the foundation. The grinder should set

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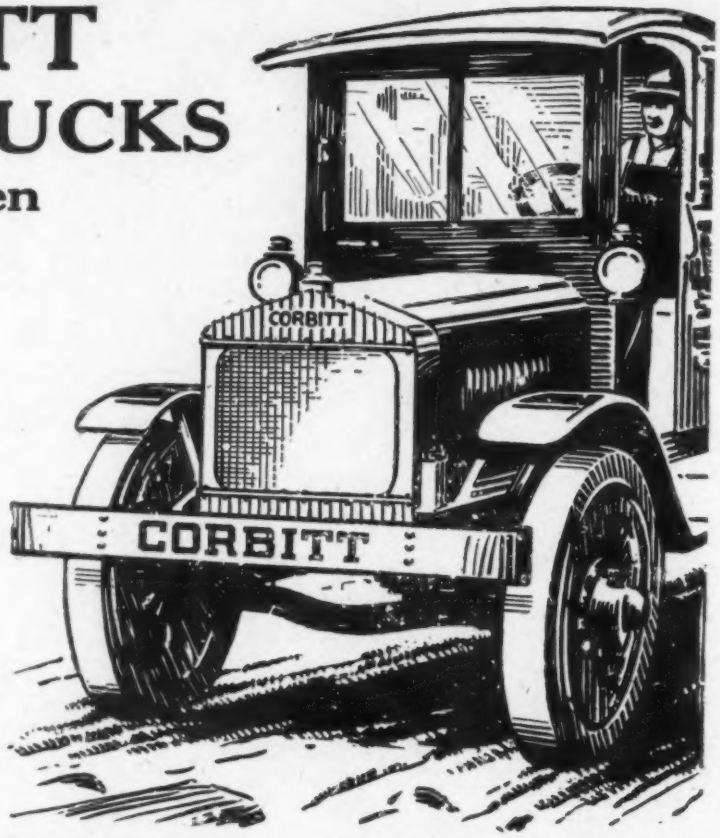
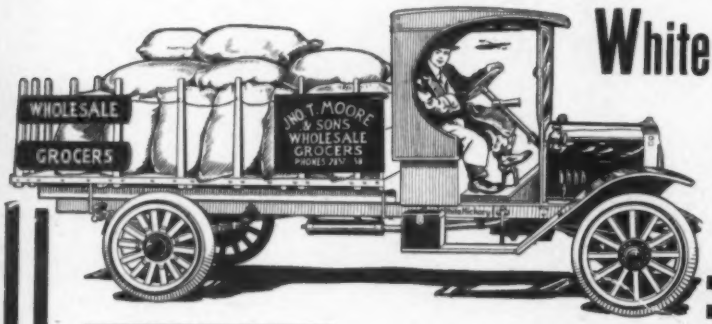


Corbitt Motor Truck Co.
Henderson, N. C.



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White Hickory Motor Corporation
ATLANTA, GEORGIA

the roller stands every time the card is ground. The cans should not be allowed to get too full as this will cause the sliver to be stretched, thus causing uneven work.

The fronts of the cards should be wiped off once an hour. In doing this, a flap rag should not be used as it knocks a lot of the dirty waste back into the sliver and is likely to get the cards torn up by catching the flap. The backs should be wiped off every day and brushed off with a whisk broom every hour and the floor swept every hour. The coiler trumpets should be watched closely and should not be bored out in order to make the cards run good as this will also stretch the sliver and make uneven work.

The traverse grinder rolls should not make less than 600 r. p. m. as it takes this speed to make the emery cut well and give a good sharp point.

In taking up drawing, fly frames and spinning, I will deal with metallic rolls for drawing, as there are very few mills using the common rolls today. The first thing is to see that the frames are leveled. The can tables must also be level and in line with the coiler heads so the cans will be full, for if they are not there will be a lot of trouble with the sliver tangling. By being full I mean that if 12-inch cans are used they should be filled to the full 12 inches. The rolls should be taken out and cleaned about once a week. In cleaning the rolls, if there are four delieveries to the frame, have a board about 12 inches wide made and have stands fixed on this board to take care of each delivery of the rolls, so that as they are taken out they can be placed in these stands just like they come out of the frame. Then they should be rubbed off with a piece of waste wet with kerosene; this will loosen up the grease and any accumulation of dirt that has formed in the flutes. They should then be wiped dry with clean waste. While they are being cleaned, burrs should be looked for, that is, where they have been damaged by the help in picking off chokes. All rough places should be removed with a fine file and then gone over with a piece of fine emery cloth and given the final polish with pumice stone.

Tension draft should be watched for as there is nothing more important than eliminating this. Good carding can be ruined right here by being stretched; the same compensating or tension gear cannot be used all the time as the tension of the drawing changes with the weather just as in fly frames. A good way to tell if the carding is being stretched is to stop the frame and press down on the sliver so much as it will stand. Then the frame is started and if the slack catches up immediately it is a good indication that the stock is being stretched and that the gear needs changing. Of course it should not be slack enough to pull into the trumpet double, but the ends should be the least bit slack.

On frames that have been run for some time, the collars become worn and it is then a hard matter to regulate them, some will run slack and others tight on the same frame. When they get in this shape about the only thing that will do any good is new front rolls, both bottom and top. The trumpets should be set as close to the calender roll as possible to prevent the stretching of the sliver and thereby causing uneven work. A sharp lookout should be kept for worn trumpets or any that have been bored out too large.

I have secured good results with the following drafts and speeds: front roll, 350 r. p. m., draft 6 inches, roll settings, first and second 1⅝ inch, second and third 1½ inch, third and fourth or front 1 5/16 inch. The stop motions should be kept in good shape so that when an end runs out the frame will stop before it runs into the rolls and makes singling. Suppose, for instance, that one yard of singling is made on the back drawing with the following drafts: front drawing 6 inches, slubbers 4 inches, intermediates 5 inches, speeders 6 inches, and spinning 10 inches; when the singling gets to the spinning it will be $6 \times 1 \times 4 \times 5 \times 6 \times 10 = 7200$ yards of singling. Therefore if there is one yard every time a can runs out, it can be readily seen that the work on the fly frames and spinning will soon be "shot to pieces."

The cans should not be run too full or the sliver will be stretched causing uneven work. The section man should go over the frames twice a day and watch out for bad work. Some of the things that do a lot of damage are weights being unhooked, a lump of cotton in one of the rolls, the stirrup resting on the steel plate or weight releasing bar; there are various other things but these are some of the more important ones. All fast running bearings should be oiled twice in ten hours, the rolls should be oiled every day using a few drops to each roll, and the clearers cleaned every two hours.

The first thing to do on the fly frames, as well as on any other machine, is to see that they are well leveled and lined, and the spindles plumb so that they will not bind when the carriage goes to the bottom. This can be tested for by running the carriage down and trying to raise the spindles out of the step. Any that will not drop back and turn easily by hand should have the bolster loosened and some thin shims of tin packed under the edge; this tin should be put under the side toward which the bolster is leaning, for instance, if the bolster is leaning to the right then the tin should be packed under the right edge, then the bolster should be tightened up. Every spindle on the frame should be gone over in this way and every time a new bolster is put in the place of a broken one it should also be plumbed.

A good way to get the frames level is to get a good man who makes that his business and have it done by the day; this should be done every year, that is, they should be leveled and lined, the spindles plumbed, the bolsters swabbed out, the flyers balanced and blocked and the pressers shaped, but care should be taken to get a good man to do this. There are some right here in the South who can do the work, but not every one who has a tool box can do it.

The roll settings I use are as follows: slubbers, back and middle rolls 1⅜ inches, front rolls 1¼ inches; intermediates, back and middle rolls 1⅝ inches, front rolls 1 3/16 inches; and speeders, back and middle rolls 1½ inches, front rolls 1⅜ inches. I give these settings as my practice under the conditions outlined as I am getting good results from them at present, but the principal rule is to set as close as the length of the stock being run will permit. And of course the settings will be governed by the weight of sliver being drawn. Just as light sliver as possible to keep up the production should be run at all times.

The hanks and drafts for these frames are as follows:

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"UTSMAN"

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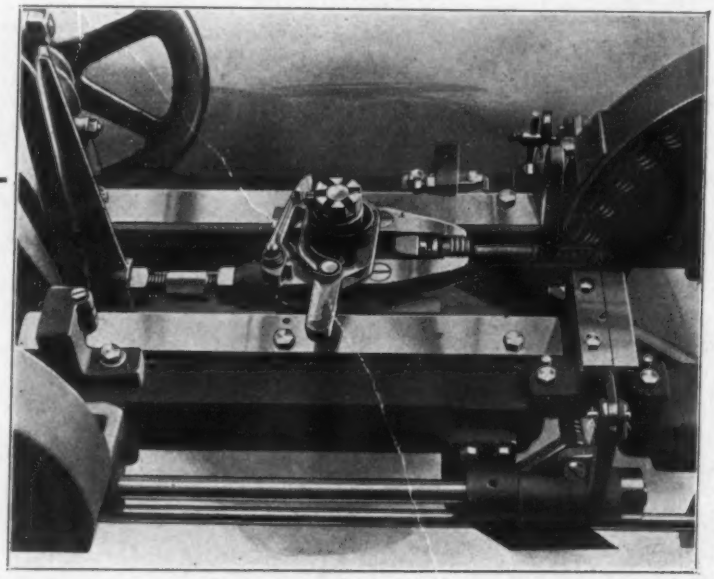

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THE TERRELL MACHINE CO., Inc.,

CHARLOTTE, N. C.

sliver from the front drawing, 52 grains per yard, draft on the slubber 4, weight of slubber roving .64 H. R.,; draft on intermediates 5, weight of intermediate roving 1.60 H. R.; draft on speeder 6.25, weight of speeder roving 5 H. R.; draft of spinning, 11.20, weight of yarn, 28s.

In cleaning the fly frames the rollers should be cleaned not less than twice weekly, all chokes being picked out, the back saddles raised and cleaned well, and a drop of oil put on the roll necks before the saddle is put back into place; also a good lubricant should be put in the wick of the saddle. Spindles should be picked every ten hours, backs brushed once in ten hours, all grease and cotton wiped from the compound every day and creels wiped off every day. Steel rolls and stands should be cleaned twice a week, the ceiling over head brushed down every day, and the frame heads twice daily. The flyers should be stripped at every doff, and the tops of the spindles between the flyer and the shoulder of the spindle picked off before doffing. The rolls should be gone over once a month and all creases or channels in them taken out. The clearers should be cleaned every hour and thirty minutes.

All fast running gears should be oiled twice in ten hours and the lifting shaft once a week. The carriages should be cleaned and new grease put in the bearings of the bobbin shaft every three months.

Stands should be oiled once a day with a good lubricant, spindles every day and steps every two weeks. The steps should be watched to see that they get the proper oiling, that is, that a good reliable man does this oiling as well as all other, as this is a place that a lot of damage can be done by insufficient oiling.

Roving from a full bobbin will weigh lighter than roving from one half-full or less, so when an intermediate or speeder is first creeled, light work will be secured. In order to overcome this have one full and one half-full to each end, that is, creel two lines at a time then when one of the rovings is running out the other one will be half full. This will help a lot in making even work.

Look out for tension draft, for if the tension is let go for a few days in March and April, or at any other time for that matter but especially in these two months, the work will be all "shot to pieces." What I mean by tension draft is draft or stretch caused by the bobbin winding more yards than the front steel roll delivers, which of course is stretching the roving, making thin places. The ends should be run as slack as possible and the hands should not be allowed to take up on them, for if the proper tension and lay-on is had, the frame will run from doff to doff without moving the belt on the cone.

Many machine builders recommend that the belt be started from a certain place on the cone, that is, a certain distance from the end. After starting the belt at the proper point, the cone gear should be changed so that the surface speed of the empty bobbin will equal the surface speed of the front roll. There should be several hygrometers in the room, located at different places, so that a record may be kept on the humidity. Try to keep as near as possible the same percentage, this will save a lot of changing.

The stroke of the roving traverse should be run as long as possible, this will help keep the top rolls from channeling. They must not be allowed to get choked up or stuck and stop. The section man should go over them every day or two and see that they are working right. Keep the slots of the flyers cleaned out so that the spindles will go down to the proper place for if they raise up it will cause tangled work and will also wear the spindles and flyers.

SPINNING.

If the work has been properly looked after in the carding there will not be much trouble in spinning, but in any event the first thing is to get the frames well leveled and lined, the spindles plumbed so they will be in the center of the ring at the top and bottom of the traverse, the guide wires directly over the top of the spindle, all crooked spindles straightened, and the ring rails leveled with the frame, that is, lengthwise.

It is also a good plan to put the level across the ring or ring rail and get it level by filing the lugs on top of the lifter rod on the high side. All this should be done at least once a year, or, better still, twice a year, and should be handled by a man who knows how, for there are not very many section men who can do a good job on a proposition of this character. But regardless of who does the job the overseer should inspect every frame before it is accepted, that is, he should take a plug just a fraction smaller than the rings and run the rings to the top and put the plug on every spindle, then mark with a piece of chalk all that are not in center and have them gone over again. He should then run the ring rail to the bottom and go over them again marking all that are not in center as he did with the ring rail at the top, for it is better to let the frames alone and let them run if they are not put in center when repaired for that is exactly what they are stopped for.

Every spindle and every frame should be watched, especially those of the fellow who says he can do two or three frames a day; I have yet to see the man who can do 400 to 500 spindles a day, for it takes a good one to get over 200 or 250 a day and do them well, and if the frames are in very bad shape he can't do that many.

I have had my overhauling done by the day and contract for the past ten years and have never had a "bum" job, but I have always made it a rule to accept the frames one at a time, that is, either accept or reject one frame before I allowed the repairmen to tear down another one.

The ring rails should work free from top to bottom. If a seven inch traverse is being run the frame should be doffed off and the ring rail run to the highest point by winding the builder back, if it is a filling wind, and if it is a warp frame, the chain should be unhooked and let up. In this way any tight place caused by a crooked lifting rod or a tight separator can be found. All frames should be set the same length of stroke.

Watch out for tangled work, for if the work is tangled after getting to the spinning, not only the stock, but also the labor it has taken to get the work this far, is lost. Enough of this waste would break any mill in the world; paying 40 cents a pound for cotton and then making it into waste and selling it at six or eight cents a pound is poor business. Mill men have to stay awake and not loaf on the job. The worst loafer in the world is the

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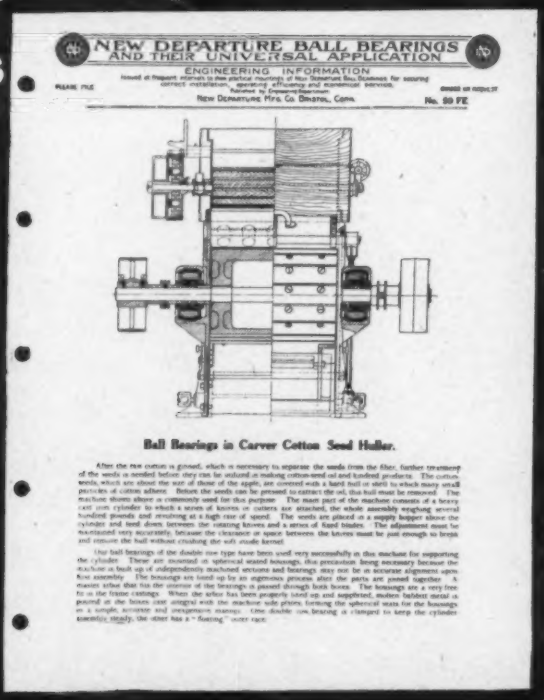

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Ball Bearings in Carver Cotton Seed Huller.

After the raw cotton is ginned, which is necessary to separate the seeds from the fiber, further treatment of the seeds is needed before they can be utilized in making cotton-seed oil and hundred products. The cotton seeds, which are about the size of those of the apple, are covered with a hard hull or shell to which many small particles of cotton adhere. Before the seeds can be pressed to extract the oil, this hull must be removed. The machine shown above is commonly used for this purpose. The main part of the machine consists of a heavy cast iron cylinder to which a series of knives or cutters are attached, the whole assembly weighing several hundred pounds and revolving at a high rate of speed. The seeds are placed in a supply hopper above the cylinder and feed down between the rotating knives and a series of fixed blades. The adjustment must be maintained very accurately, because the clearance or space between the knives must be just enough to break and remove the hull without crushing the soft inside kernel.

Our ball bearings of the double row type have been used very successfully in this machine for supporting the cylinder. These are mounted in spherical seated housings, this precaution being necessary because the machine is built up of independently machined sections and bearings may not be in accurate alignment upon first assembly. The housings are lined up by an ingenious process after the parts are passed together. A reamer arbor that fits the interior of the bearings is passed through both boxes. The housings are a very free fit on the frame castings. When the arbor has been properly lined up and supplanted, molten babbitt metal is poured in the boxes now integral with the machine side plates, forming the spherical seats for the housings in a simple, accurate and inexpensive manner. One double row bearing is clamped to keep the cylinder assembly, rigidly, the other has a "floating" outer race.

one who will loaf and draw pay for it. We have to go forward, for the mill business is like riding a bicycle—when we stop we have to either get off or fall.

The roving traverses should be watched and set as long as it is possible to run them without the roving running out at the sides. Take a roller that has been running for some time with about a half inch stroke and lay it on some smooth surface and see if it touches anywhere except at the ends. This worn roll will cause uneven work and make the spinning run worse than will any other one thing. The weight levers must not rest on the creel boards. The frames should be gone over every week and all slack bands cut off and replaced with new ones, the travelers cannot be regulated with some spindles making 7,000 r. p. m. and others 5,000 r. p. m. This will help on soft yarn, especially where there is trouble in getting it soft enough. Get all the spindles up to speed and then cut the speed of the cylinder, say ten per cent, and change the twist gear to bring the front roll back up to the proper speed, and some times the twist gear can be changed to increase the production, for the ends will not balloon as badly at the lower spindle speed.

All rollers should be cleaned three times a week on numbers from 20s to 30s and on coarser work they should be cleaned every day. The roving should be wiped every other day, the guide boards should be blocked out every hour, backs wiped every day, railings brushed every hour, heads and rockers cleaned twice a day, clearers cleaned every two hours, floor swept every hour and steel roll stands should be cleaned twice a week.

Spindles should be oiled every week and the back rollers once a week; the front rolls should have just a little oil put on them every day. This is a good method. With a Thompson oil can held in the right hand, let the oil run down on the forefinger; then just touch the neck of the top roll with the finger, which will give sufficient oil if there is some put in the saddle about twice a week. Dry rolls will cause uneven and kinky yarn, and when a new roller is put in there should be plenty of oil put on it, for after being put in hot water to remove the old flannel at the roller shop, rolls are usually rusty. A good clean oil should be used and not some old black oil from the heads such as the section man sometimes uses.

The frames should be gone over six or eight times a week and all damaged rolls taken out and replaced with new ones. This is not extravagance, but is necessary if good running work is desired. Of course good rollers should not be thrown out, but bad ones should not be run, especially in the middle. You can get by with some bad ones in the back but the middle rolls should be as good as the front rolls.

Everything possible ought to be on piece work, especially the doffing, for if the doffing is done by the piece, that is, so much a doff, the only trouble will be to watch the boys to keep them from starting too soon. One boy should not be allowed to have a section to doff by himself, but there should be at least two boys on each section; for instance, if it takes one boy ten minutes to doff a frame and get it started, two boys, will save five minutes every doff which will amount to something in a week's run. Spinners should be taught to keep waste off the floor, this is very easily done if started right. The cost of cotton should be explained to the spinners and they should be told that waste from the spinning is worth more than raw cotton from the bale as all the waste previously in the stock has been removed.

A good plan by which to weigh yarn is as follows: Get 16 bobbins from the card room, being sure to get some from each frame, eight from the back line of spindles and eight from the front line. Take this to the spinning room and set it in; this should be done on each number of yarn that is being run. Then weigh from these bobbins, weighing each skein separately. A record of the actual weights should be kept and put on a daily report and turned in to the office. In this way any undue variation can be caught. Do all changing on the speeders, thereby keeping all light or heavy work out of the spinning. These same bobbins should be weighed by the carder before being put into the spinning.

A draft of eleven will work all right with 1-inch staple cotton, double roving, but a draft of ten would be better if the card room can keep up and produce roving light enough to give this draft. Rollers should be set 1 1/32 inches apart from center to center, in other words, set as closely as is possible without making cockled yarn. This is absolutely necessary if a good smooth yarn, free from thin places, is desired. Test the breaking strength every day and if it is not breaking up to standard, break several skeins and get a good average.

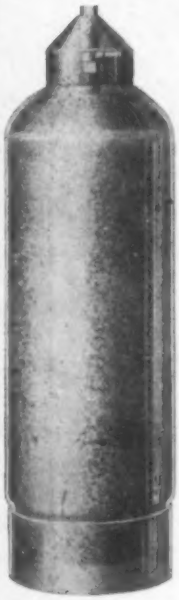
The Draper Corporation give in their *Textile Texts* the following rule for determining standard breaking strengths, on page 108 of their fourth edition: "1900 plus the number of yarn; then divide this by the number of the yarn, this for warp yarn. For soft yarn multiply the number of the yarn by 13 and then subtract this from 1900 and divide the remainder by the number of the yarn."

Some of the things that will cause weak yarn are poor staple cotton—that in which the staple is too short; rolls set too far apart; tension draft; rolls not properly oiled in the spinning and card rooms; and beaters set too close or beaters that have been sharpened and left with a rough edge. There are other difficulties but these are the ones that give the most trouble.

I might go ahead and say a lot about managing help, but every one has his own way of managing help. The main thing is to get the machines in shape so they will run well, then the help question is a small matter for good running work and sufficient pay will hold operatives, while poor running work will drive them off quicker than anything else. I enforce the rules of cleaning and oiling and have the machines set throughout both carding and spinning as previously mentioned and am averaging three pounds per spindle per week of 110 hours as the mill is running both night and day on number 28s hosiery yarn.

The only way that I have found to run two shifts successfully is to let the day overseer have charge of both shifts, that is, he hires his men to run his room at night and is responsible for both shifts, the night man taking all orders through him and not direct from the superintendent. When the rollers are cleaned the night help clean certain frames and the day help also have certain frames to clean. In this way a lot of confusion is avoided; if there is a frame of rollers skipped we know immediately which shift neglected it. Each shift keeps a record of the doffs from the spinning and also of the doffs that are wound. In this way we can check the winders and tell if there are any checks getting away for which yarn is not wound.

Contributor No. 10.



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Bleaching With "Liquid Chlorine."

EDITOR COTTON:

We are interested in securing information regarding the practical use of "Liquid Chlorine" in the bleaching of cotton piece goods, and would appreciate if you could advise us through your columns on the following points:

1. For chemiking or bleaching 64 x 60 38½ inch 5.35 plain cloth in lots of 35,000 yards or about 6,500 pounds of cloth, which would be run through a chemic well and chemic squeezer at a rate of about 200 yards per minute and then dropped into the chemic bin for the white to work up; how many gallons of chemic prepared from Liquid Chlorine and Twaddling one degree would be required?

2. How many pounds of Liquid Chlorine would be needed to produce the quantity of chemic at one degree Twaddle to take care of lots as given above and what would be the approximate price per pound of Liquid Chlorine?

3. Could you describe the process and apparatus required for turning the pounds required of Liquid Chlorine into chemic at one degree Twaddle?

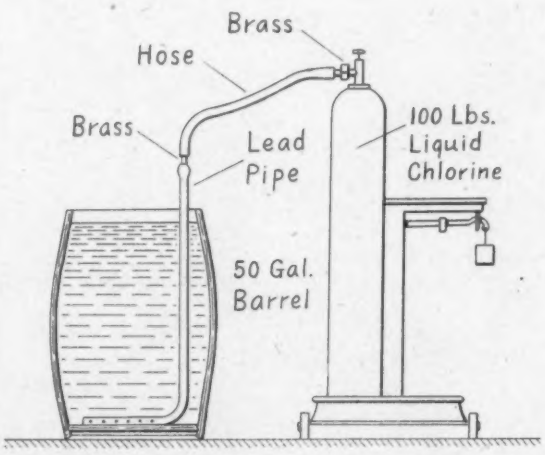
We realize that this will call for quite a lengthy answer, but thank you in advance for any helpful information you can give us.

Septimus (New York).

EDITOR COTTON:

I submit the following in answer to the questions of "Septimus (New York)" in regard to the use of "Liquid Chlorine" in the bleaching of cotton piece goods.

Question No. 1. No exact answer can be given because

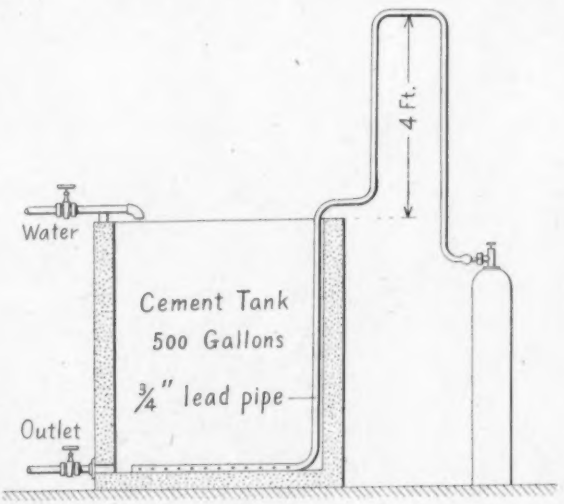


the condition of the cloth varies so much depending upon the care and skill of the individual bleacher in charge of the operation. The quantity of chemic, in my opinion, would not have so much bearing on the final whiteness of the cloth, as its bleaching strength. If "Septimus" is thoroughly familiar with chloride of lime, he had better use a solution that twaddles somewhat higher, as a bleach solution made of "Liquid Chlorine" is much more active than one made of chloride of lime.

Question Nos. 2 and 3. I am sending herewith two sketches in connection with each of which I quote two formulas for making a bleaching solution with "Liquid Chlorine", and describe the method. One of these formulas is made without caustic and is not as stable as the one made with caustic, and should be used only when the solution is used the same day it is made. This will give a twaddle of about 12 to 14 degrees, and for bleaching purposes should be diluted to about 1 ¼ degrees Twaddle.

One of the sketches shows how the solution can be made on a small scale, and the other how it can be made on a large scale.

The formula for preparing a solution of "Liquid Chlorine" for bleaching purposes on a small scale, without caustic, is: 1 bbl. (50 gallons) of water, 35 pounds of soda ash (58 degrees) and 10 pounds of "Liquid Chlorine". To prepare it on a small scale, with caustic, the following



formula is given: 1 bbl. (50 gallons) of water, 20 pounds of soda ash (58 degrees), 8 pounds of caustic soda (76 degrees) and 10 pounds of "Liquid Chlorine".

The following formula is for preparing bleach solutions on a large scale, without caustic: 500 gallons of water, 350 pounds of soda ash (58 degrees) and 100 pounds of "Liquid Chlorine". With caustic: 500 gallons of water, 200 pounds of soda ash (58 degrees) 80 pounds of caustic soda (76 degrees) and 100 pounds of "Liquid Chlorine".

Electro Bleaching Gas Co. D. K. B. (N. Y.)

EDITOR COTTON:

In replying to "Septimus," we would say that the process and apparatus for chemiking 6,500 pound lots of cloth of the quality and weight mentioned should be as follows: (this covers questions 1 and 3).

He will require two 600 gallon concrete tanks so as to have one in use while the other is being prepared, i. e., being mixed. These tanks may be situated at any convenient spot any distance from the bleaching room and must be piped from nearly the bottom to a 2,000 gallon concrete chemic and squeezer well in the bleach house, 2,000 gallons is not arbitrary but is the size the writer is used to. Squeezers can be attached to the well or the goods can

Save Your Reeds

IT is true that good weaving cannot be done with dirty, rusty or scratched reeds; but why discard them on account of shuttle and temple marks or other abrasions?

The Automatic Reed Cleaning and Polishing Machine

not only smooths the face of the reeds, but cleans and polishes between the splits.

THIS machine requires no operator, and it has proved a highly paying investment in the many mills where it has been installed.

PATENTED in the United States and in foreign countries.

Manufactured by

Shawmut Engineering Company

179-195 Freeport Street,
Boston, Mass.

Manufacturers of Novel Textile Appliances
Designers and Builders of Special Machinery

Southern Agency

Atlanta Harness and Reed Manufacturing Company
123 Walker Street,
Atlanta, Ga.

be chemiked on the regular washing machine by means of a centrifugal pump which will lift the chemic from the 2,000 gallon tank below the floor into the washing machine box from which, when full, it constantly overflows back into the chemic tank again thus keeping up a constant circulation of the liquor.

The two 600 gallon mixing tanks are charged as follows: About 200 gallons of water are run into each, and 250 pounds of soda ash and 60 pounds of caustic soda are dissolved in the water in each tank. After the soda is all dissolved water must be run in to cool the liquor off to 75 degrees F. The reason for this is that when the temperature gets much above 70 or 75 degrees F., the hypochlorite which is formed by the combination of the chlorine and the soda begins to decompose and the bleaching strength is low. This is also liable to occur if the chlorine is run in too rapidly. The chlorine can be fed into the soda solution as fast as it will absorb it without raising the temperature above 70 or 75 degrees F., or bubbling up to the surface, which will show that it is running into the tank too fast to be absorbed. The deeper the tank, the more rapidly it will take up the chlorine on this account. A thermometer must be used constantly to keep tab on the temperature. Many bleachers use soda ash alone for the mixture but this will not answer for a permanent well or tank as it makes a very unstable mixture which decomposes very rapidly and, though it may twaddle all right, it contains little or no active chlorine.

After mixing the soda as described and cooling it off the chlorine is fed in by means of a perforated lead pipe connected with the container and carried to the bottom of the tank. The container should be placed on a platform scale above the tanks and 100 pounds of liquid chlorine run out of it slowly into the tank. When this is done the tank should be filled up with cold water and the resultant liquor should stand at 8 to 10 degrees Twaddle; 200 to 250 gallons of this run into the 2,000 gallon well in the bleach house will make 2,000 gallons of liquor at 1 degree Twaddle. This one degree Twaddle should contain 2½ grammes per liter of available chlorine.

It must be remembered that this liquid chlorine mixture or hypochlorite of sodium is not like a mixture of chloride of lime, it is quite unstable and while the hydrometer (Tw.) does to a certain extent show the chlorometric strength of chloride of lime it gives little indication of the bleaching value of sodium hypochlorite and must not be depended upon. While the goods are being run, as long as bleaching action is occurring, the chlorometric strength of the liquor is falling, though the twaddle strength may remain the same and therefore a little fresh strong liquor from the mixing tank must be continually running into the well to keep the standard of available chlorine.

In regard to question 2, as to how many pounds of liquid chlorine it would take to produce the quantity of chemic at 1 degree Twaddle to bleach the quantity of goods "Septimus" wants to handle, this is a question I cannot answer, as this will depend upon two factors over which the writer has no control nor knowledge. In the first place, the quantity of chlorine which is used in actual bleaching depends entirely upon the thoroughness of the preceding operations of boiling, etc. In the second place, I have no knowledge of the quantity of available chlorine in the original liquid chlorine from which the chemic is made, i. e., the liquid chlorine in the container.

However, if the goods are thoroughly boiled and prepared before chemiking it should take about 45 pounds of available chlorine to bleach them which is represented by 135 pounds of chloride of lime or 50 pounds of liquid chlorine containing 90 per cent of active and available chlorine.

Now, therefore, if the bleaching liquor at 1 degree Twaddle contains 2½ grammes of available chlorine per liter, this will equal 11 grammes per gallon. Again, if it takes 45 pounds of available chlorine to bleach the quantity of goods mentioned, 45 × 459 grammes = 20,655 grammes ÷ 11 grammes per gallon = 1,878 gallons. In other words, if the bleaching liquor stands at 1 degree Twaddle and contains 11 grammes of available chlorine per gallon (or 2½ grammes per liter) it will use up all the available chlorine in 1,878 gallons of it to bleach 6,500 pounds of cloth. This loss must be replaced, as the goods are being run, by the continual feeding into it of 187 gallons of the strong chemic from the mixing tanks so as to keep the strength uniform until the operation is finished. It will therefore be seen that the ultimate result is that it has taken 187 gallons of the strong chemic to procure results.

In passing, we would say that 1 degree Twaddle chemic is too strong for such goods, ½ degree Twaddle is sufficient if the goods are boiled right. Also that hypochlorite of soda is a ticklish thing to handle, if too alkaline it will not bleach, if not alkaline enough it will not keep; hence, a proper equilibrium must be maintained, which is difficult. Also, all solutions should be kept from the light. Keep it dark. W. B. (Maine.)

Announces Change of Business.

The Baker R. &. L. Company, Cleveland, Ohio, announce an expansion of their business which will allow for greater production of Baker industrial trucks and Raulang bodies. The change includes the sale of the electric passenger car business to Rauch & Lang, Inc., Chicopee Falls, Mass.

The manufacturing space made available will result this year in tripling the industrial truck output and doubling the body production. E. J. Bartlett, general manager says, "We believe in an extraordinary future for the industrial truck and that present industrial conditions are going to result in mounting sales during the next few years. Our new policy will permit of necessary expansion to meet conditions as we foresee them."

The Baker R. & L. Company commenced business over sixty years ago as coach builders and later have been prominently identified with the electric vehicle industry. They built the first electric road vehicles offered for sale on the American market and fifteen years ago attracted much attention with the Baker Torpedo Kid, an electric racing car that established the world's kilometer record and attained a speed of 128 miles per hour at Ormond Beach, Fla.

A man who cannot mind his own business is hardly capable of minding that of someone else.

Films Can Tell About Cotton Industry.

BY DOUGLAS D. ROTHACKER.*

Cotton mills should have told the truth about child labor long ago. Also about the living and working conditions at the mills.

It was not because the professional uplifters had anything in particular against the industry which clothes the world—that's not the reason they worked, and still work, to keep the eyes of the country focused toward the ——— conditions in the cotton mills. (The adjective "——" is used because the uplifters have an abundant store of adjectives and how is one to tell which particular word tool is most likely to appeal to their intellectual fancies?)

The economic law is the reason the cotton mills continue as a target.

Even an uplifter must eat.

It is becoming more difficult every day for an uplifter to make an honest living.

Trying to save the world from being ruined by motion pictures has ceased to be a very profitable vocation. Some of the uplifters are still hanging on in this field of endeavor—for they are a determined specie and their souls are fired by the spirit of the crusader. But the more provident ones are casting about for something else which will support them in the style to which they are accustomed. These latter do not propose to lower their standard of living simply because the film folks have told the public the truth about censorship and because the great majority of producers are making pictures which do not need censoring—and the law is capable of caring for the other kind of films.

Any uplifter-in-chief who has the history of past uplifters in the cotton industry before him can realize what grand picking it has been for the honest worker whose trade it is to save the world. Therefore he will no doubt continue to look for a share.

There is only one way to beat this tribe.

Beat them to it.

Tell the people of Maine, of Kansas, of California,—the people of the entire United States—the truth about the cotton industry. Tell them the truth before the uplifting brethren can tell them more lies. If the public knows the truth it will be harder for the uplifters to collect the funds with which to wage a campaign for new child labor laws. Without funds they will have to find something else to save.

The cotton industry should take the United States into its confidence. The people of the North, East, South, and West should be invited to visit the mills and see for themselves. Otherwise, just as sure as the Mississippi flows, the public will continue to view the cotton mills through the eyes of uplifters.

Motion pictures make it possible for the American people to see for themselves. The 110,000,000 cannot go to the mills, but the mills can be loaded upon the celluloid magic carpet and taken to the people. The day seems to have arrived when industries' business is the public's business. Many industries have decided it might be best for everybody concerned if the public, when it learned about an industry, learned the truth.

The American people today are seeing a motion picture which gives a comprehension of the oil industry—from the drilling to the last by-product.

Another film takes a theatre audience hundreds of feet below the ground where coal is being blasted from nature's treasure chest and then loaded for hoisting to the surface. After viewing the miners at work the audience visits them at their homes and sees how they live.

The public may consider the price of shoes high. There are two sides to the story. There are now two films being displayed in the theatres over the country which give the people a better idea of the skilled workmanship, the costly machinery and the investment required to make a shoe today.

These three educational pictures were made in the last few months.

National advertisers are finding educational pictures profitable from strictly an advertising point of view. The National Biscuit Company wanted to impress the public with the cleanliness that prevails when science and modern invention does baking for the nation. After the cookies and crackers have been baked they must be packed, and the National Biscuit labels on the boxes are a natural, logical part of the film. And when the Rothacker organization sends that picture over its circuit of 2,500 theatres, having a total attendance of about 10,000,000, the movie patrons will, as long as they live, associate cleanliness with the National Biscuit label.

A cotton mill picture would make a most interesting educational film. People would like to see the adventures of King Cotton from his picking until he comes out of the mills in the form of cloth. Such a film would not only acquaint America with the true conditions of the cotton mills; the film could be so arranged that the buying public would remember the trade mark of the goods made in the mill which was visited via the celluloid rapid transit.

*Service Department Rothacker Film Mfg. Co. of Chicago.

INVENTIONS, their Development, Purchase and Sale. By William E. Baff, Patent Attorney. 230 pages.

This book is a manual on the marketing of inventions, and views the subject from various angles. In its broader aspect it is a book on business policy and is prepared to enlighten inventors and others about plans by the aid of which inventions may be profitably exploited.

It is published by the D. Van Nostrand Company, 8 Warren St., New York City, and a copy may be secured either through COTTON or direct from the publishers for $2.00 net.

Eight new buildings of brick, tile, concrete and steel construction either have been constructed or are well under way at the new plant of the Atlantic Dyestuff Company at Portsmouth, N. H.

The Griscom-Russell Company, 90 West Street, New York City, is sending out Leaflet No. 6 briefly describing all the apparatus manufactured by this company and designed to be a ready reference to show its line at a glance.

KNITTING SECTION

The Attention of Manufacturers is invited to our

NEW MODEL K

Producing a fabric without lines, using a latch needle, permitting speed of production, the making of heavy heels and toes and perfect plaiting

Increased width of top and a greatly pronounced loose course for looping are features of great value

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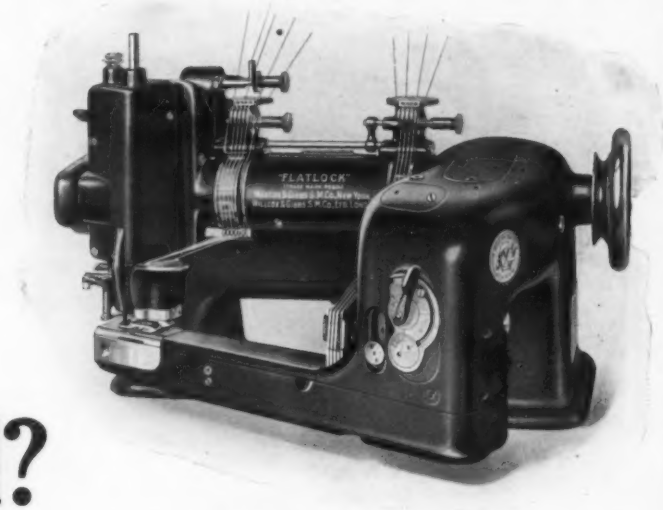
Are There Flatlock Machines In Your Mill?



The Flatlock Seam is universally recognized today as pre-eminently suited for knit underwear. Almost without exception leading manufacturers are using Flatlock Machines and the Flatlock Seam has become a permanent feature of their garments.

Yet there are still a few manufacturers who for one reason or another are not using the

"FLATLOCK" REG. U.S. PAT. OFF. seam

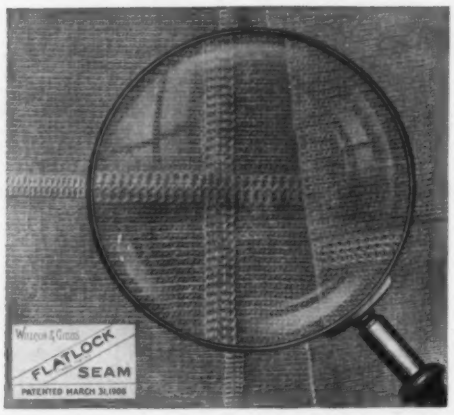
The Machine that makes

The Seam that sells the Garment

Are you one of them? If you are it would seem a waste of your time and ours for us to enumerate the manifold advantages which the Flatlock Seam will afford you. You surely are familiar with them.

Yet you have a reason for not using Flatlock. Other manufacturers in the past have had reasons for not using Flatlock. Today, with Flatlock Machines working in their mills and Flatlock Seams helping to sell their garments, they wonder at those old reasons. Some day you will do the same.

We should be glad to answer any questions which you may have to ask regarding the Flatlock Machine or the Flatlock Seam.



Trade Mark

Reg. U. S. Pat. Off.

WILLCOX & GIBBS SEWING MACHINE CO.

HOME OFFICE: 658 BROADWAY, *Corner Bond Street*

NEW YORK

Willcox & Gibbs S. M. Co., Ltd., London, Paris, Milan, Brussels.

Canadian Representative: W. J. Westaway Co., Ltd., Main and McNab Street, Hamilton, Ontario

Trade Mark

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Meeting of Southern Knitters

Knitting manufacturers of Chattanooga, Tenn., and vicinity were hosts to nearly seventy-five manufacturers from Alabama, Georgia, Kentucky, Louisiana, Mississippi and Tennessee at a meeting of knitting interests at the Hotel Patton, Chattanooga, on April 6, and at the conclusion of the very interesting session were given a rising vote of thanks for extreme hospitality.

The outstanding features of the meeting were optimistic expressions in relation to the knit goods market outlook and a general determination to adhere to fair prices, and a strong sentiment in favor of the "open shop."

As showing the trend toward the open shop as best calculated to preserve price and wage equilibrium, it was related by a manufacturer who had just returned from an extended tour in the interests of his mill that sentiment in that direction is spreading very fast. In Phoenix, Arizona, it was stated, placards are displayed in shop windows calling for the open shop principle. It can be successfully maintained in a strict observance of the Golden Rule, it was held.

"If you will show yourself worthy of confidence and if you will show you have confidence in the other fellow, confidence and cooperation will come to you. If you take an unfair advantage of a situation, look only to the immediate goal, excuse any unfair advantage on the ground of good business, you are simply taking a short sighted view of business and of life and digging a pit into which you will later fall."—Pres. T. H. Johnston.

The same manufacturer spoke of the results of his study of the practices of trade associations, in several of which, he said, there is maintained in service a person under the title of employment head. No member of an association conducting such a service will consider an application for employment until it has been passed on by the employment head. In this way, it was found, chronic disturbers can be passed along until they find themselves barred from factories using the service and be left to take the best jobs they can get in mills not interested in keeping the agitator out.

The operation of the application of the Golden Rule in employment was outlined by a mill executive who has had satisfactory experience with its operation in the Southwestern Division of the National Association of Hosiery and Underwear Manufacturers. His remarks and those of the previous speaker, who touched on the workability of a help clearing house, left such a profound impression that there was unanimous demand for a committee to outline in detail a policy to be pursued. The following committee, to which also was referred all resolutions, was appointed:

W. B. Davis, W. B. Davis & Son, Fort Payne, Ala.

A. W. McLellan, Alden Mills, New Orleans, La.

E. O. Davis, Paducah Hosiery Mills, Paducah, Ky.

Harold Lamb, Union Manufacturing Co., Union Point, Ga.

Champe S. Andrews, Cotton States Hosiery Mills, Chattanooga, Tenn.

D. L. Rosenau, Rosenau Hosiery Mills, Tuscaloosa, Ala.

Warrant for the views of the manufacturers that at the bottom the knit goods market is fundamentally sound was found in reports from mills selling both to jobbers and to retailers direct. The executive of one in the latter class stated: "The retail trade bought more heavily in March than in February, and to date have bought in greater volume for April than in March. From the construction and equipment work ahead—the railroads will require about 500,000 new cars—I cannot conceive that there will be any diminution in the country's purchasing power, so that, it would appear, retailers are buying wisely."

An executive who keeps in close touch with the mill's jobber customers and frequently goes out among them with samples and prices, reported booking the biggest business in January for any month in the history of the mill. But February fell off about one-fourth of the January sales and March sales were about one-half of those in February.

The mill has had but two export orders in five months, but foreign business is steadily developing, it was stated, and little doubt was felt that shipments abroad will be heavy with improvement in the exchange situation.

Retailers in this country do not have large stocks, was the opinion of a manufacturer who completed a tour of investigation for guiding his mill in operating for the future. The jobbers, he said, continue to sail close to the shore. Summarizing, he said: "Manufacturers should sit steady and not give way to alarm over delayed buying. In my opinion, manufacturers should not invite demoralization by reducing prices, particularly since recessions cannot be made except at a sacrifice of profits necessary for meeting abnormal demands for revenue. I fail to find ground for pessimism."

It was the thought of a number of those present that the larger manufacturers must continue to preserve an unbroken front in order that those less favorably situated may not be persuaded by speculators to let go of merchandise at ruinous prices, on the theory that it were better to hand profits over to other interests than wait for the revival that has dawned.

Champe S. Andrews, Cotton States Hosiery Mills, quoting from trustworthy reports from Germany, said machinery there is intact, but that Germany, ordinarily consuming about 1,800,000 bales of cotton in a year, has at present approximately 6,000 bales, and is in no position for obtaining more on the direct purchase plan, as the cost of cotton landed in Germany approximates four dollars a pound. Business in Germany is brisk, in spite of the low value of the mark, it was stated.

"Be not too cheerful," was the advice of one manufacturer to those assembled. He feared, he said, that the public would not take kindly to the high prices, and he was afraid also that there will be no decline in the prices of fine count yarns. Interests other than knitting manu-

ALWAYS FIRST WITH — THE — LATEST

ALWAYS FIRST WITH — THE — LATEST

BANNER

FULL AUTOMATIC

HOSIERY MACHINES

SIMPLICITY — SPEED — PRODUCTION — QUALITY

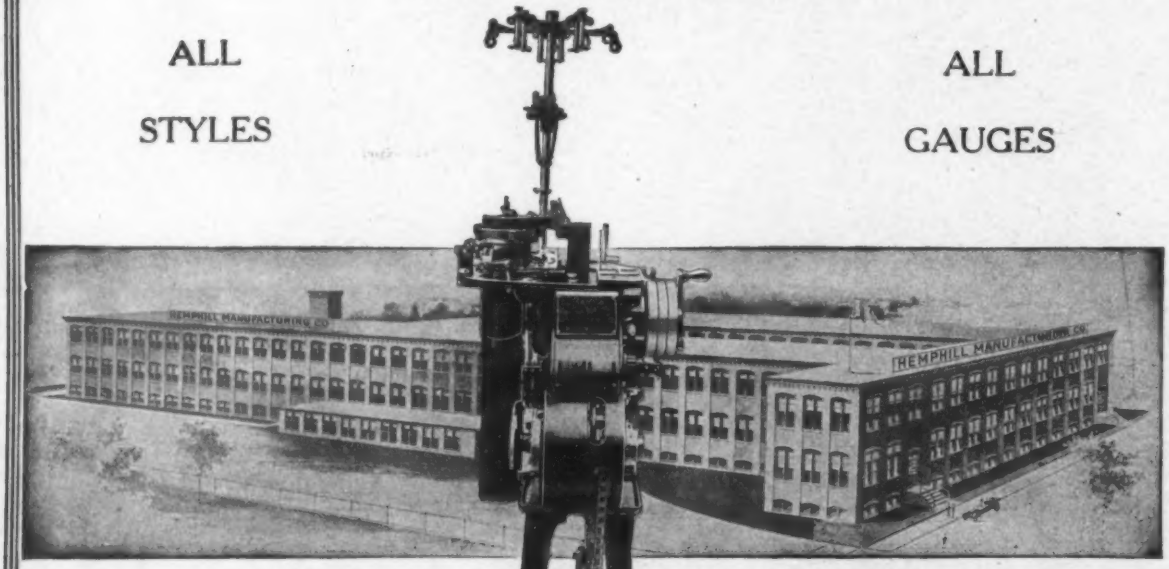
Four important things to consider when buying Hosiery Machinery.

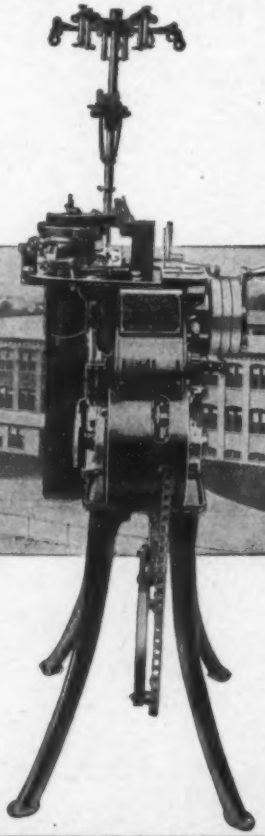
ALL PARTS ACCESSIBLE FROM FRONT OF MACHINE

Write for descriptive catalog

ALL STYLES

ALL GAUGES





HEMPHILL COMPANY

Main Office and Factory.

Pawtucket, Rhode Island.

Southern Office and Show Rooms
912-913 James Bldg., Chattanooga, Tenn.

Philadelphia Office and Showrooms,
Rooms 205, 209, 210, Colonial Trust Company Bldg., 13th and Market Sts.,
Philadelphia, Pa.

facturers probably will absorb any surplus that might accumulate, this speaker thought.

In department stores, where there is a satisfactory volume of business, it was pointed out, goods bought at lower prices than those at which the merchandise can be replaced are being sold and the public is receiving the benefit of the wisdom of these store managers in having bought heavily before prices had advanced to present levels. It was the opinion that stocks in the department and other retail stores are low, but there lingered the question, will the public buy at the new prices? It is held by some observers that prices in some of the retail stores appeared to be based on the merchandise bought for fall and that therefore there are sections where the public already is paying the highest prices that could be reasonably asked this year.

Deflation of values, being brought about by the Federal Reserve Board, it was represented, for lowering prices of commodities, was deplored in several addresses. A very large order for knitted goods for a foreign country had to be declined recently, it was stated, because the bank would not permit discount of the draft with which payment was to have been made. Thirty days earlier, the manufacturer reporting the matter said, the draft would have been discounted without question.

The effect of this deflation process, it was feared, might be the accumulation of stocks in the domestic market, to the detriment of manufacturers and employees. It was suggested therefore that manufacturers buy and sell cautiously.

The yarn situation was viewed by one speaker as somewhat hazardous, and he urged that manufacturers neither buy yarns far ahead nor sell their product for distant delivery.

There is no possibility of a material drop in the price of cotton, said an executive from a leading southern spinning mill. He thought the combed yarn spinners were sold up, practically, to September. There are commission houses, however, which have shaded prices recently, it was admitted, but these prices were pointed to as not offering a criterion.

Stress was laid on the representation that a long and favorable growing season is necessary for the production of long staple cotton. It was a question whether the present season has thus far been such as to encourage the hope of a large production of long staple cotton in 1920.

One of the more optimistic persons at the meeting was a representative of a southern cotton mill who stated his mill recently made a 300,000 pound processed yarn sale at prices slightly under the highest that have been on record during the period of high prices.

The meeting was presided over by T. H. Johnston, Knoxville (Tenn.) Knitting Mills Co., President of the National Association of Hosiery and Underwear Manufacturers.

President Johnston, whose optimism, so forcefully expressed at the meetings immediately following the armistice, has not deserted him, opened the meeting with an address in which he said in part:

William Dean Howells has said that "men are more alike than unlike one another. Let us make them know one another better, that they may be humbled and strengthened with a sense of their fraternity."

This is one of the things the National Association of Hosiery and Underwear Manufacturers has tried to do for its members during the past two years. I believe we have all become better acquainted by the frequent meetings we have had and, by knowing one another better, we have learned to think more of one another.

We have cultivated in some degree a spirit of cooperation, probably not as much as we should, but I believe we have laid the foundation for splendid constructive work along this line which will be helpful to us all. A better understanding leads to mutual confidence and mutual confidence leads to cooperation.

But what is cooperation?

The dictionary says that cooperation is the act of working jointly together. Now please notice it is not an expression of approval of some system or plan or the

PRESIDENT T. H. JOHNSTON.

recognition of some principle, but it is the act of working jointly together on this plan, system or principle which has been put into effect.

Cooperation is the very foundation of business success. It is the basis of civilization and without cooperative effort very little can be accomplished. It dates back from the beginning of time when Cain tilled the soil and Abel herded the flocks. Cooperation has ever been the price of achievement. It has been said that a man's intelligence is in direct proportion to his ability to cooperate.

Now, if some of you here want to test this out, you may take this for your measuring unit to-day. We cooperate many times a day, often we do so unconsciously. The very existence of many activities in different avenues of life is solely dependent on cooperation. In business we cooperate for our good. We often do so for pleasure, but this is not the kind of cooperation that I wish to speak about.

The intelligent cooperation that I have just mentioned is exemplified in the working jointly together or cooperating in any plan or system that contributes to the good of all; that gives the greatest good to the greatest number

The Improved Latch Needle Machine

Fig. 1. Plain Fabric Machine.

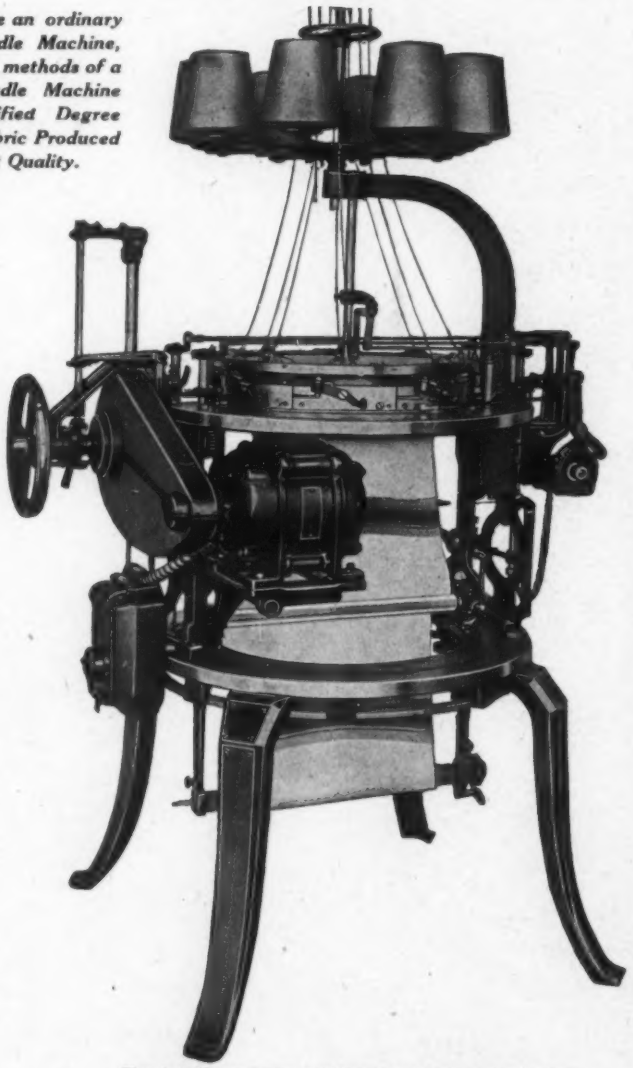
[[Looks like an ordinary Latch Needle Machine, but has the methods of a Spring Needle Machine in a Modified Degree and the Fabric Produced is Excellent Quality.

THE objection to the ordinary form of latch needle is that each needle forming its stitch separately, on its own, so to speak, causes the loops to exhibit minor variations in size which precludes the use of this machine for goods of the best quality.

The Wildman Latch Needle Machine may look like an ordinary machine, but the fabric which it produces proves that it's the most perfect machine in its class.

Perfect control is exerted over the loop formation by the use of sinkers in addition to the latch needles. Uniformity of stitch and smooth fabric is assured.

The Wildman Motor Drive Knitting Machines are appealing to the manufacturers who demand utmost production and a more efficient and sightly plant. The Wildman Motor Drive increases production 10 to 15 per cent as there is no loss due to belt slippage—no belt to guard—unsightly belts and shafting done away with, giving more light and a better-looking plant—machines located more easily and their position changed quickly.



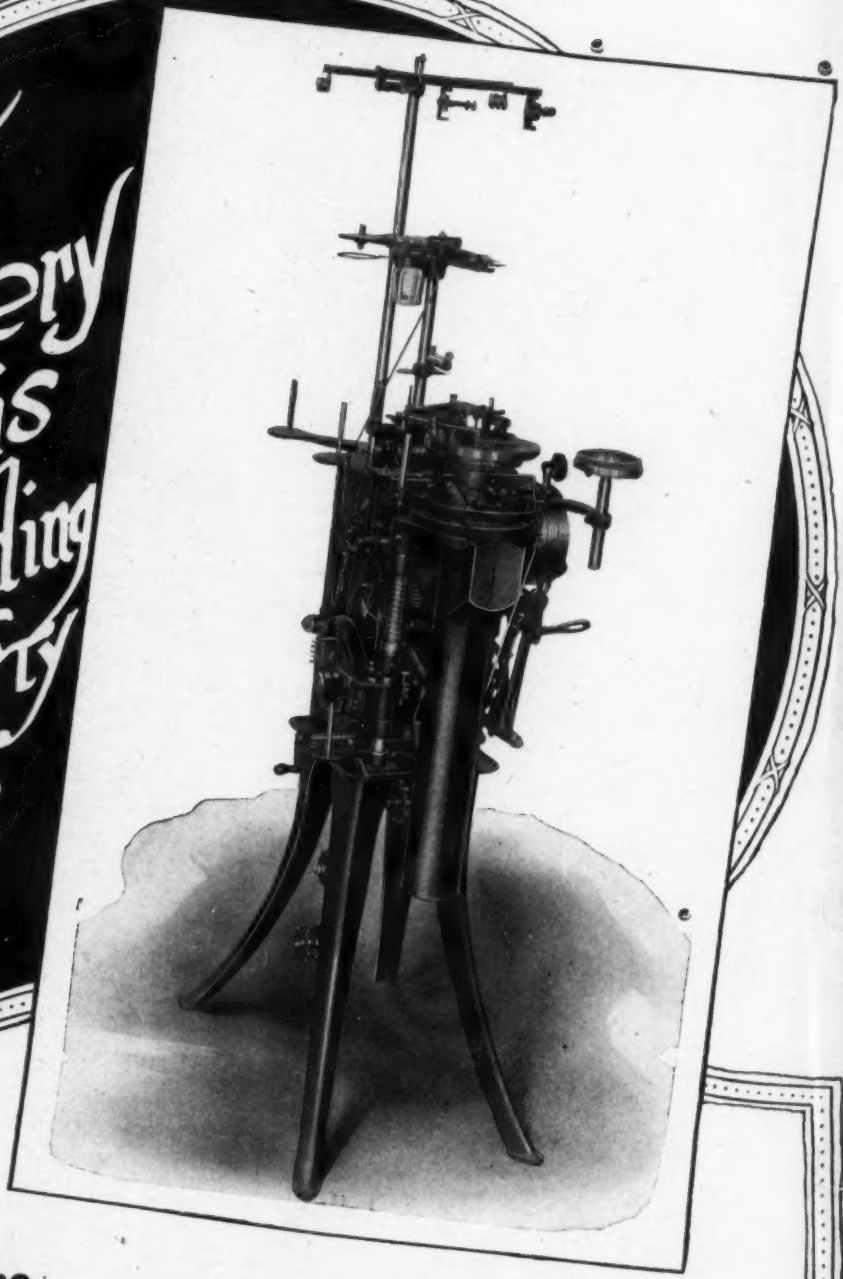
Showing Motor Drive Bathing Suit Machine, Back View.

Write today for the Wildman catalog.

WILDMAN MANUFACTURING CO., Norristown, Pa.

WILDMAN KNITTING MACHINERY

The Hosiery Buyer is Demanding QUALITY



This Superior Machine Produces the Highest Quality Fabric Free From Lines

The hosiery buyers of today are demanding the highest quality they can buy,—if you can't supply them, they'l, buy somewhere else.

There are different makes of knitting machines on the market, producing good fabric, but everyone knows the advantages of the spring needle machine for knitting hosiery, especially when using silk, and everyone knows that to make the finest and smoothest fabric free from any trace of imperfections it takes a WILDMAN Spring Needle Knitter.

The product of this machine finds a ready sale and a better price for the goods.

Get into this exclusive market—supply the demand for quality goods—by installing the WILDMAN Machine.

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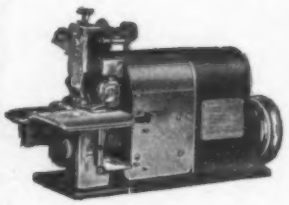

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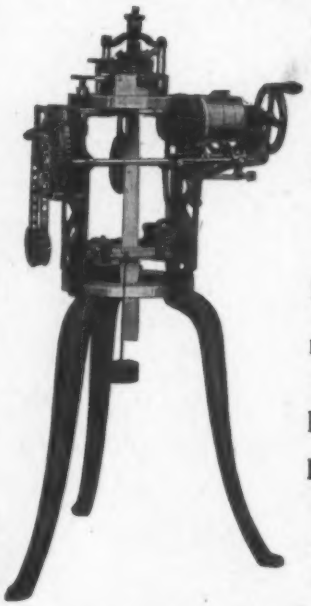

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and, in so doing, renders a service to humanity itself and to business as well.

During the last two years our Association has been through many trying experiences, its members taking on as much war work as possible in the beginning, and, in steering its way through the armistice period, many new ideas have been fostered, many plans developed and, I believe, some good has been accomplished; and now that this is the last meeting of our Association in this Division before our Annual meeting, which is to be held in Philadelphia on April 27th to 30th, I have felt it is right to call this Division together so that we can discuss all matters of interest to the welfare of its members—we could recommend to the National Association just what work we felt should be done in this Division during the next Administration, so that we could lay our plans for working and cooperating jointly together in this Division in a way that will continue to prove helpful and satisfactory for all.

As your retiring President, I am recommending that our National Association be divided into five divisions, for the convenience of its members; have five Vice-Presidents, one in each Division, so that meetings can be called as often as the members desire and so that the interests of the members in each Division can be looked after; so that mutual interest and cooperation can be engendered and cultivated in a helpful cooperative way, which will give national strength to our national organization, and personal service to its members.

We have, as you know, effective in this Division what we call the Golden Rule Resolutions which, in conformity to the State Law, forbid the direct or indirect solicitation of labor on the part of our members. We have a Grievance Committee to handle such complaints as arise, and one of our members has also been acting as investigator of such complaints when reported. While these resolutions have not been lived up to to the letter by all of our members, I feel that we have minimized to a great degree the trouble we have had and, by investigation of these complaints, we have found that 99 per cent of the trouble and dissatisfaction that we have had has been entirely the result of misunderstandings.

By bringing these members together, we have been able to smooth out many of these rough places and to bring them to a better understanding, which has led them to a closer cooperation; has stopped in a great degree the useless floating of labor from one place to another that we have had, and, as a whole, I believe, has resulted well for the mills and for labor as well.

We did not start out with the idea that this plan was going to be perfect. We did not expect smooth sailing all the way along. It is impossible for mankind to create anything that is perfect. The Ten Commandments have never been perfectly kept by any one. If a man wants to steal, he can steal. If a man wants to kill, he can kill, but for every sin there is a penalty and there is a penalty for breaking the spirit of these resolutions which is greater than any other punishment, that is, the loss of the respect of your fellowmen and of your associates in business.

We are learning to appreciate more and more, that money without principle is failure and that it pays to keep alive your manhood and your integrity and not barter or swap these for achievement or gain. What is more pitiful to-day in life than to see a man who nurtures in his brain only a money gland which secretes dollars, while he permits the remainder of himself to go entirely out of business? Is it not pitiful to see a man who possesses money and nothing else: a little weazened, dryed up human form standing by a huge pile of dollars and nothing else to rest on?

Now, please do not understand me that you cannot make money and be fair. I claim that you can make more, because you can get more cooperation, you can get more sympathy. You can build for yourself a broader and more useful life by developing your facilities along the lines of right principles which is deserving of, and does have, the respect of your fellow associates.

Charles M. Schwab, who to-day controls the largest industry in the United States, in speaking recently before the students of Princeton University, stated to these young men that the first element of success is an unimpeachable integrity, that there is no man who can accomplish anything of very much value in this world without preserving his integrity.

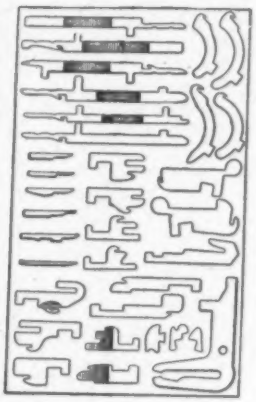
He further stated that no man can have the confidence and approval of his fellowmen, or be successful in his undertakings with other business men, if he does not have the reputation of being a man of honor and integrity. By this, I do not mean that a man shall be so high in a moral and social state of life that he is incapable of any action that might not be regarded as always right, but the world has the highest regard for a man who, when he has done something wrong, manfully admits it and constantly sticks to the truth of integrity under all circumstances.

Sir Albert Stanley, formerly President of the Board of Commerce of the British Parlament, stated a few days ago that the world and big business need to-day, more than anything, men who can handle titanic affairs, and there is no price too great for such men with good common sense, with unimpeachable integrity and who have the unswerving confidence of their fellow associates.

Only this class of men can handle the large affairs of life and get the support and cooperation that is needed for success.

In closing I want to importune you to cultivate confidence in one another. If you will show yourself worthy of confidence and if you will show you have confidence in the other fellow, confidence and cooperation will come to you. If you take an unfair advantage of a situation, look only to the immediate goal, excuse any unfair advantage on the ground of good business, you are simply taking a short sighted view of business and of life and digging a pit into which you will later fall.

When misunderstandings occur with your fellow associates, if you will not allow yourself to be prejudiced by the reports that come to you from subordinates, but go manfully to one another in a personal way, you will find that in practically every case you have misunderstood the intention and the act and a personal conference, or exchange of letters, will often set everything right, whereas, if you get angry before you have knowledge and take the matter in your own hands to fight it out along the same lines without having full knowledge of the other's point of



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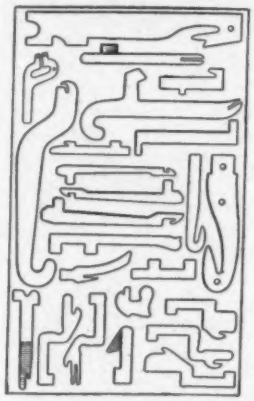

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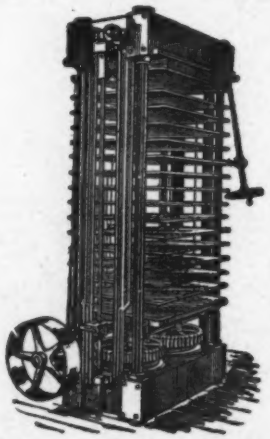

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view, you will both be poisoned by the same arrows of anger and inharmony; dissatisfaction and unprofitable business will be the result.

The committee on resolutions reported the following, all of which were adopted:

RESOLVED. That the affairs of the National Association of Hosiery and Underwear Manufacturers have been energetically, wisely and unselfishly administered under the splendid leadership of our president, Thomas H. Johnston.

RESOLVED. That we extend the thanks of the Southwestern Division to C. B. Carter, National Secretary, for his aid and cooperation at national headquarters in the affairs of this Division.

RESOLVED. That we reaffirm our undivided allegiance to the practice and theory of what has now become the "Golden Rule Resolution," and that we recognize much of its success is due to the execution of the details of the Rule by the chairman of the Grievance Committee, Harold Lamb, and to the promptness with which the mediator, Mr. B. G. Brumby, has responded to all requests for his services.

RESOLVED. That we recommend that the By-Laws of the National Association of Hosiery and Underwear Manufacturers be so amended as to provide for a vice president of the Southwestern Division of the Association, and that the Southwestern Division be recognized as a legal sub-division of the National Association, and that the vice president become ex-officio a member of the Board of Directors of the National Association; and that this Division have the power specify the duties of its vice president so far as they relate to the affairs of the Division, and so long as the duties are not in violation of the Constitution and By-Laws of the National Association.

RESOLVED. That the vice president become the mediator in all disputes arising under the operations of the Golden Rule Resolution, and that he appoint four members of the Division to act with him in an advisory capacity in the discharge of his duties as mediator and all other official duties, those four members to be known as the Advisory Board; and that they be empowered to employ such assistance, clerical and otherwise, as may be necessary, and that they be authorized to establish an office which shall be the official headquarters of this Division; that the Advisory Board be territorially representative of the membership of the Division so far as practical.

RESOLVED. That the expenses of the vice president's office be assessed as a charge against the members of this Division on the basis of their respective invested capital, such assessment to be determined by the advisory board and to be agreed to by the individual members before the assessment becomes binding on that member.

RESOLVED. That the vice president and advisory board be empowered to conduct:

1. A clearing house of information of wage scales for skilled and unskilled employees.
2. An employment register.
3. A record of surplus stocks of raw materials, supplies and machinery for sale by the members.
4. A circular letter and questionnaire department to secure information and disseminate it for the good of the membership.
5. Such other activities as are conducive to the well being of the members of the Division.

RESOLVED. That we recommend this meeting appoint Mr. Frank L. Miller, Jr., as the vice president of this Division, to serve for one year or until his successor shall have been elected and qualified.

Philadelphia Conference of Knitters

A close survey of the mill help situation was made at a meeting of the seamless hosiery manufacturers in Philadelphia, where agitators, encouraged by the strike of employees of commercial dye houses, were fomenting trouble. Every manufacturer present was opposed to granting any increases so long as the complaint of high prices of commodities prevails, and one said he would enter into an agreement with all manufacturers to not yield to a single demand for more pay, even though a general strike might result.

"We have reached the wage limit," said one mill executive, from whose establishment fifty loopers walked out to enforce a demand for increased pay. He promptly notified every seamless manufacturer in the city that wages would not be increased a quarter of a cent a dozen. In four days the loopers returned to work at the scale existing when they struck.

In another mill knitters gave notice they would not return to work on the Tuesday following Easter unless given five cents per dozen additional. "We want five cents more" said the person speaking for the proposed strikers.

"So do we," was the reply, of the ready mill manager, "and we do not know where we are going to get it.'

"Well, we won't work next week." the knitters announced.

"Neither will we," they were told by the mill head. "We will not work until you return at the pay you are getting or your places have been filled."

The knitters returned on Tuesday and have not since been heard from. It has been shown in several recently threatened troubles that firmness on the part of manufacturers won the day.

High prices in the retail stores are believed to be responsible for many of the demands of mill operatives. They seem to think the abnormal prices mean abnormal profits for manufacturers. In one mill recently it became necessary to convince an operative heading a strike movement that the mill price to a department store for a line of silk boot hosiery of the mock fashioned type was only $16 a dozen. The store was getting three dollars a pair, having a profit of 125 per cent.

Manufacturers who have been exercised over the question whether the consumer will pay the higher prices that seem imminent and have been doing some investigating, say some of the department stores already are pricing goods on the basis of what they will pay under the prospective increases. If this be true, the public is paying all that could be reasonably asked this year.

Hosiery and underwear manufacturers in the interior section of Pennsylvania at the April meeting of the trade, exchanged views of the knit goods market situation and brought out the fact that while jobbers in the main were still disinclined to operate, the outlook called for adherence to prevailing prices.

The mills of practically all the forty manufacturers present are supplied with business for the next few months, and, while orders recently have not been of moment, no concessions have been made to stimulate buying.

Hosiery manufacturers reported an increased number of jobbers looking for merchandise, and in the more expensive lines there are indications of activity in the very near future.

The buyer for one of the leading jobbing houses quite recently requested of a Berks county mill executive that he do not sell up for April without first advising the buyer's house; that the establishment would want the mill's line very soon, but was not permitted by the merchandise manager to buy at this time. The mill is so comfortably situated, the executive stated at the meeting, that he refused make a commitment to the jobbing house representative. The latter, however, deferred buying, until his principals change their attitude.

Several buyers were reported admitting to mill heads that they expected to pay higher prices than now prevail, and one said, "I cannot understand the house, for they know we will have to do a lot of buying in four to six weeks."

The light weight underwear manufacturers said it was improbable prices for spring 1921 would be named before July, although, it was admitted, jobbers might force them to come out in June.

Questioned whether they were receiving any dupli-

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cate business for the current season, several said they have had small orders offered to them, but were sold up to the end of the delivery period.

Manufacturers stated they were in better position than early in 1919 to resist an onslaught on prices, and, profiting by the experience of last year, several speakers said, manufacturers as a whole might be expected to stand pat.

Confidence in the yarn market, it developed, is largely back of the optimism of many of the manufacturers as to the finished product situation.

All agreed that the yarn outlook was for continuance of present price levels, and this view was strengthened by a statement, based on actual knowledge of transactions, that 20s 2-ply carded were sold in the previous week at 90 cents and 25s single combed peeler from selected long staple at two dollars.

Furher reports were to the effect that it will not be possible to increase the output of fine count yarns proportionately with prospective demand, spinners being unable to obtain deliveries of additional equipment for from six months to two years.

A spinner having a contract for spindles will not get delivery before the second quarter of 1921, and deliveries against contracts being made now cannot be made before 1923, it was stated.

Discussion of the latch needle situation brought from a visiting member evidence of a severe shortage in China. A person but recently returned from that county is in the market for 100,000 of the scarcer types of latch needles, it was stated. Most of the manufacturers reported having their needle wants fairly well supplied.

By unanimous vote the meeting adopted a resolution recording opposition to any of the proposed daylight saving plans not having the backing of a federal law.

The Knit Goods Market

The primary markets for all commodities necessarily were affected by the outlawry by which term the almost nation-wide strike of railroad employees soon came to be known. While food prices went to very high levels when the strike situation became acute, knit goods, which were not moving, showed not the slightest recessions. Some few retail dealers, however, moved prices up as almost depleted stocks moved down in quantity.

The embargoes on shipping which were a sequence of the strike supplied evidence that among many dealers there was absolute need for goods. This phase of the situation developing, it was but logical that mills and commission houses assumed even a more determined attitude than had prevailed in the matter of maintaining values.

A disastrous effect of the outlawry was the closing of practically every avenue through which ordinarily merchandise could be delivered in an emergency such as existed for more than a week. Spot delivery orders, the mainstay of a great part of the trade in the last month, were valueless to both buyer and seller. Jobbers could not help out their retailer customers, nor could they obtain merchandise from mills for filling the vacuum that already existed.

In several instances mills were facing a famine in yarns, and even before the strike tied up transportation a number were receiving southern yarn direct from mill by express, while having contracts for yarn in eastern warehouses that could not be shipped because of the embargoes. Tons of yarn were moved by express within a week, one mill alone paying more than $2,000 in express charges, all of which but added to cost of production, to be passed along to the strikers later and to the burdened general public.

Throughout the crisis knit goods prices remained firm, and excepting mercerized lines, hosiery sold at the market so far as it was possible to sell in the period of mob rule on the transportation lines.

The bottom of the knit goods market was seen about mid-April. But even then there were factors for strength in the very near future. Incidents which come to light in relation to transactions which ordinarily would possess no significance frequently have a very great influence in averting demoralization.

Trading in underwear has been in lighter volume than in hosiery. A few—very few—duplicate fall orders have come through, and there is some filling-in buying of light weight for the current season.

If nainsook prices can be accepted as a gauge of the advances that will go into effect for knitted underwear for Spring 1921, the jobbers have yet to hear high figures.

A canvass of a number of representative jobbers discloses that practically none look for relief from high prices that are said to be giving the trade so much concern. But they may be expected to operate very conservatively when they return to the market.

Few jobbers can be found who think they would buy underwear in June for spring 1921. Among manufacturers it is coming to be felt that it were better the opening be deferred until after the Fourth of July holiday period.

Heathers were popular last year as an economical substitute for silk stockings, and will be in demand next winter, but production is being increased so fast that it may more than overtake demand.

Jobbers, and retailers as well, are as fearful of silks as of mercerized. Silks are not moving in worth while quantities in the primary market, although attracting much attention in department stores.

That silk hosiery will cost the consumer no less next winter than at present is the deduction from the mid-April announcement of the McCallum Hosiery Co., Northampton, Mass., selling to the retail trade exclusively. The company says:

"The McCallum hosiery being delivered this spring to retail merchants was ordered last fall. The prices of our product for the fall of 1920 will be exactly the same as the prices for the spring of 1920, with the exception of one number. This one number is increased less than seven per cent."

The announcement leaves the inference that the McCallum Co. was covered for silk while thrown was selling at $12 to $14 and under, and it is not believed any hosiery of moment that has been sold, was made from silk costing manufacturers more than $14 to $15. The fact that one number in the McCallum line is advanced

slightly is viewed as an admission by the company that the price trend is upward. Few lines of silk hosiery really are competitors of the McCallum numbers. The company's announcement, it is thought, will attract more attention in France than in the domestic market.

A mill making women's seamless silk hosiery, mock fashioned, has taken the line off the market and, it is understood, will offer none so long as thrown silk commands the prices at which it now is held.

It is becoming a question whether the sporty heather mix hosiery in worsted and merino will not be in so great supply next winter as to disappoint a number of manufacturers who but recently commenced making the line. One of the large mills has sold hundreds of thousands of dozens and is one of a number that is thought to have gotten the top skimming of the cream of the business. An establishment which recently circularized the trade on heathers has been swamped with inquiries from important jobbers, and, instead of looking for buyers, will have to use fine discrimination in making allotments of the quantities at its command.

A Central Northwest jobber, who last December placed with an important mill making high grade underwear exclusively a very large order, recently sent shipping instructions by which the mill is to make shipment direct to the mill's customers. These shipments, all case lots, will absorb more than four-fifths of the entire order, and some of the garments, all invoiced at the highest prices at which the mill ever sold underwear, are invoiced at more than $30 a dozen. The jobber had gone out and sold.

Prices named on nainsook underwear for spring 1921 show radical increases, yet jobbers have bought. A number which in 1919 opened the season at $7.25, has been taken by a few jobbers at $11, and another number, which last year was sold at $5.75 now is $9.65.

One of the very large hosiery mills billed out 300 per cent more dozens in March than in the corresponding month for 1919, and, measured in dozens, its invoices to jobbers amounted to fully as much as in March 1918. The same ratio per month, it is stated, can be maintained to October with orders already on the books.

One of the larger hosiery jobbers in New York has been having a phenominal business in a well known branded line, a fact that is well known to other jobbers and manufacturers as well.

An Eastern direct-to-retailer mill was booking hosiery orders up to the time the strike situation became acute in good volume at new and higher prices.

A manufacturer of misses' carded ribs who recently advanced his price to $3.75, rise 15 cents, fall 10 cents, has received several orders at the new figure. With some mills, all the misses' ribs that are offered, at $3.75 to $4. are being taken.

Women's fine gauge cotton hosiery has been selling freely at and around $4.25, many jobbers taking combed and carded hosiery in preference to mercerized at mill prices.

The jobbing trade has yet to become reconciled to mill prices of mercerized hosiery. A mill which holds women's mercerized stockings at $7.25 for 220 needle and 260 needle at $7.50 admits they are causing no excitement among jobbers. Several manufacturers of mercerized are not offering the lines for the present, feeling the trade is prejudiced, but that eventually there will be no difficulty in obtaining prices based on present yarn cost.

A commission house which offered a standard quality at $6.50 and found buyers not interested has practically abandoned the line for the time. The house is fairly well stocked at prices considerably under present values, but is not disposed to give all the profit to distributors. Jobbers who were speculating in mercerized lines are assumed to have about reached the end of their stocks, and future purchases will be made from mills, at rational prices, it is felt.

A direct-to-retailer underwear mill has received from a road salesman several orders for delivery to December 31, and the salesman insists on being permitted to book business, which he represents is available, for fall 1921. It should be stated, however, that in the territory in which this salesman is operating, heavy weight underwear is worn practically twelve months in the year.

Just why dealers balk at buying for the future at the radical advances that must be made to conform to mill cost is shown by a dealer using, as an illustration, a line of underwear from a direct-to-retailer mill. The line was sold last year at $10 for the winter of 1919-20, and was sold by the retailer at $1.25—$15 a dozen. On the basis of the present price, $15.75, for next winter his customers will have to pay him two dollars per garment—$24 a dozen. The dealer is less concerned over this phase of the situation than with the question how he is to finance future purchases. To buy at $15.75 a dozen, he points out, he will have to re-invest the capital which was involved in last year's purchases and all the profit on the garment, to which he still must add seventy-five cents per dozen.

This retailer feels that he is facing two serious alternatives, one of which he must choose. He either must invite the accusation that he is a profiteer or take his chances with bankruptcy. He has a case or two of the $10 underwear in stock, but is afraid to sell at replacement value, lest a price-regulating sleuth pounce upon him and charge him with exacting an exorbitant price in selling for $24 a dozen what cost him $10. If he sells on the basis of last year's cost he will be in danger of lacking funds with which to replace his stock. He is one of a great number of merchants zealous for maintaining an unimpaired credit who may be compelled to curtail their purchases or operate on the costly hand-to-mouth plan. Even though convinced that prices will be higher, he cannot well do otherwise. How far-reaching will be the effect of this situation is one of several hundred questions with which manufacturers and distributors as well will have to wrestle.

England was the heavier buyer of American hosiery in February, taking 302,025 dozens of cotton and 21,471 dozens of artificial silk. Cotton hosiery to the value of $3,689,267 was exported from the United States in February, the shipments amounting to 1,220,271 dozen pairs. This exceeded by more than 200,000 dozens the exports for October, the high water month for 1919. Exports of artificial hosiery in February amounted to only 50,186 dozens, which was 13,000 dozens for December, the lightest month in 1919. The February artificial silk exports were valued at $367,198.

Countries taking more than 10,000 dozens in February

were Colombia, 18,742; Peru, 15,566; Uruguay, 22,383; Venezuela, 12,363; Argentina, 51,038; Cuba, 72,284; Belgium, 19,715; Denmark, 99,305; France, 91,840; Greece, 16,739; Italy, 12,531; Netherlands, 31,330; Norway, 47,326; Rumania, 20,785; Sweden, 51,908; Turkey in Europe, 14,889; Turkey in Asia, 11,682; Russia in Asia, 66,667; Canada, 32,660; Dominican Republic, 18,681; Australia, 27,456; British South Africa, 16,013; Egypt, 21,572.

The showing of exports to European countries at a time when foreign exchange was far below its parity in the country in which the shipments originated is regarded as indicating a wide open market abroad, to satisfy which there will be a strong demand on American mills. Noteworthy in the reports of exports is the quantities sent to the Latin American Republics, which appear to be still depending largely on the United States for supplies.

An unusual showing of the fundamental soundness of the knit goods market from the viewpoint of the manufacturer is made in reports and statistics supplied by wholesale dealers in dry goods during a period when buying was suspended so far as was consistent with demand on distributors from the retail trade for immediate delivery merchandise. The facts and figures, pointing toward low stocks in the hands of jobbers and combatting the idea that a break in prices is imminent, are the more significant for the reason that they were volunteered by the interests which have been trying to make it appear it would be impossible to do business on the present price levels. The information, while intended to place before those supplying it a word picture of the condition of stocks and a perspective based on a retrospective, is most important in that it should have the effect of dispeling the fear of demoralization that disturbed easily affrighted interests, and justifies the attitude of manufacturers who steadfastly refused to be alarmed and name ruinous prices for at once restoring the activity that is destined to be witnessed in the regular course of market events.

No less important than the reports of 100 jobbers to a banking house showing a 22 per cent reduction in stocks from the fall of 1919 to the fall of 1920 is the schedule of comparative prices accompanying the recent market letter of the National Wholesale Dry Goods Association. An analysis of the comparative price figures reveals very moderate increases in mill prices of hosiery and underwear in contrast with the gains for yarns and decrease in work hours for 1920 as compared with 1915 and the years intervening.

Taking 16 counts of cotton yarn, including mercerized, it is shown that price increases range from 300 to 650 per cent., the average increase on the 16 numbers being 432 per cent.

Ten numbers of men's and women's cotton underwear are shown to have increased in cost to the jobber, since 1915, from 161 to 303 per cent, an average of 225 per cent for the ten numbers.

Eleven numbers of cotton and mercerized hosiery for men and women underwent increases running from 106 to 384 per cent., the average being 275 per cent.

Comparisons of the increases in hosiery and underwear with advances in the cost of yarn do not take into consideration the greater overhead expense due to a decrease of 20 per cent in work hours since 1915 and a shorter workday by eleven per cent since 1919. Neither is there presented an estimate of the further increase in overhead because of lessened efficiency and the restriction of output by union operatives.

That knit goods prices have not advanced in the same relation with the cost of production is further shown when such items as packing, shipping cases, dyes, chemicals for bleaching, and tape and buttons for underwear are taken into the reckoning. Four items in dye and chemicals show an average increase of 141 per cent. In buttons and mercerized tape as a class the increase was over 300 per cent. Box paper, strawboard boxes and shipping cases as another class, show an average increase of 198 per cent.

Wages per hour are up 150 per cent in contrast with 1915 and 25 per cent higher than in 1919, with fewer working hours and less production per hour. Cotton is approximately 269 per cent higher than in 1915. While yarns show an average advance far above that for cotton, the goods made from the yarn have not increased so radically in price, a showing that is construed as meaning that if there has been profiteering the manufacturers of knit goods have been the least to offend.

The disclosure of most interest to the consumer from the schedule of price comparisons is that relating to the increases in manufacturers' yarn costs since 1919—an average of 57 per cent for 16 numbers. As manufacturers have been buying little yarn recently, except for immediate requirements, it must be assumed that none of any moment is in stock for making up the light weight hosiery that will go over the retail counter next winter and the underwear and hosiery to be delivered to dealers next Spring. The yarn cost of articles made from mercerized yarn will be 60 to 68 per cent higher.

Men's 5½ pound balbriggan shirts and drawers made from 18s single carded or 20s combed peeler, consuming say six pounds of yarn, will be subjected to an initial increase from 42 to 55 per cent in yarn cost. The average for these yarns in 1919 was 56½ cents for 18s carded and 88 cents for 20s combed. The present market value of 18s carded given in the schedule of price comparisons is 87 cents, an advance of 30½ cents, amounting to $1.83 for the six pounds of yarn that will go into next year's 5½ pound balbriggans.

Purchasing yarn at present prices, the manufacturer of 144 needle half hose would have to add 30 cents a dozen, which probably would mean five cents a pair to the consumer. Men's mercerized half hose of 220 needle made from 60s or 70s 2-ply yarn would need be advanced more than a dollar a dozen, and women's mercerized stockings approximately $1.75 if the manufacturer bought at last year's average yarn now in stock and were to buy for the future at to-day's prices.

Manufacturers attach much importance to the statistics compiled by a banking house from reports from 100 jobbers in 31 states representing the Atlantic and the Pacific coast and Central West, Gulf and Lake sections, showing that from fall 1918 to fall 1919 their stocks had been reduced from $84,581,171 to approximately $65,226,017. For the purpose of comparison as to quantities 20 per cent was deducted from the values for 1919, given as $81,520,021. Thus the stocks of these jobbers were reduced 22.8

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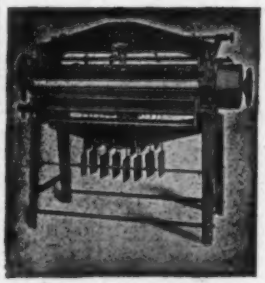

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per cent at a time when the public was buying normally. As jobbers have been buying nothing of moment in the last three months it is reasoned that stocks in their warehouses must be quite low.

While the figures apply, of course, to only the 100 jobbers reporting to the banking establishment, it may be assumed that what is true of them in the matter of stock reductions is true of the jobbing trade at large. It is noteworthy that the action of the jobbers in converting merchandise into cash was in accord with the desires of the Federal Reserve Board, which, however, had not started the deflation process until after the stock reductions had been effected.

Jobbers sold throughout 1919 in a rising market and seem to have sold at replacement value, for, it is shown in the reports of the 100 referred to, that they had very large profits. In the fall of 1918 they had liabilities of $8,792,207 in excess of quick assets. Their fall 1919 report showed quick assets in excess of liabilities by $13,456,200, a gain of $22,000,000, or 49 per cent for quick assets.

At the outstart of 1920 the 100 jobbers were in an exceedingly comfortable position financially and cannot be suspected of carrying over any great stocks of merchandise. If the public buys normally the jobber will have to buy largely, it can be assumed, and it would appear he has the funds in bank for financing his transactions. Only a world calamity, it would seem, could stand in the way of a revival of buying on a plane assuring steady operation of machinery for many months.

The situation as shown by the bank report of reduced stocks and the comparisons of prices presents three alternatives:

1. Dealers to buy at present or higher prices.
2. Manufacturers to restrict production to known demand.
3. Reductions of wages and cost of yarns and supplies.

Unfortunately for the consumer, the trend of wages is upward; in any event, it will be a courageous employer who puts a lower wage schedule into effect. Recourse to the second alternative would at the start diminish buying power, while working toward higher prices by reason of insufficient supplies for a time, wages tumbling eventually, perhaps, when demand for employment became as acute as is the present demand for more production.

Merchants will not willingly become a factor in forcing either the second or third alternative; they will buy in response to demand, with competition keen between the jobbers and the mill-to-retailer manufacturers. There can be no escape from the prices established by yarn values, payrolls and operating costs. And it may be regarded a foregone conclusion that, with yarn stocks in mill warehouses running low there will be a scramble for merchandise made from yarns bought at last year's average prices, which, as shown, are owned at 57 per cent less than the cost of yarn taken at present values. The low price yarn will have become exhausted before one-half the trade has bought a fraction of its requirements.

The J. Spencer Turner Company, New York City, has been appointed sole selling agent of the Fulton Cotton Mill Company, Athens, Ala. This mill has just installed new machinery to double the capacity and specializes on high grade 20/2 yarn.

Among the Knitting Mills.

The Tioga Knitting Mills, Philadelphia, Pa., recently incorporated, have completed plans for the establishment of a new plant to be devoted to the manufacture of infants' hosiery.

The Federal Knitting Company, Philadelphia, Pa., will make alterations and improvements in its building at Janney and Cambria Streets, to facilitate operations. Contract for the work has been awarded.

The Goldstein Lasar Company, New York, has filed articles of incorporation with a capital of $150,000 to manufacture hosiery, underwear, etc. Jesse Lasar, H. H. Goldstein, and Max Levin are the incorporators.

The Fuld & Hatch Knitting Company, Albany, N. Y., has completed arrangements for the construction of a new four-story top addition to its plant, for increasing operations. Contract for the work has been awarded.

The Notaseme Hosiery Company, Philadelphia, Pa., has awarded a contract for the construction of a new two-story concrete boiler plant, about 48 x 107 feet at Venango and I Streets. The structure, with equipment installation, is estimated to cost $50,000, and will afford increased power facilities for the company.

The Winner Hosiery Mills, New York, has been incorporated with a capital of $25,000 to manufacture hosiery, etc. M. F. McGowan, E. A. Terry, and F. Kenneth Harder are the incorporators.

Winship, Boit & Company, Wakefield, Mass., manufacturers of knit underwear, etc., have completed plans for the construction of a new four-story building, about 50 x 180 feet. The structure is estimated to cost about $150,000. This plant is to be known as the Harvard Knitting Mill of the company.

The Slatington (Pa.) Hosiery Company, recently incorporated with a capital of $20,000, is planning for the operation of a local plant for the manufacture of hosiery and knit goods.

Taubel Brothers, Philadelphia, Pa., manufacturers of hosiery, have practically completed the removal of their dye and finishing departments to the company's works at Hatfield, Pa.

The Shonzberg Knitting Company, Buffalo, N. Y., has changed its corporate name to the Angora Knitting Mills.

The Weierman Hosiery Company, Philadelphia, Pa., has completed the removal of its establishment to larger quarters at 1324 North Lawrence Street, for increased operations.

The Moorhead Knitting Company, Harrisburg, Pa., manufacturer of hosiery, is said to be planning for extensions, additions and improvements for increased capacity. The company has called a meeting of stockholders for June 5, to vote an increase in the capital of the company from $1,000,000 to $5,000,000 for business expansion.

The Krossknit Direct Mills, Inc., 387 Rider Avenue, New York, manufacturer of underwear, hosiery, etc., has increased its capital from $200,000 to $300,000 to provide for general business expansion.

Arrangements have been completed by John K. Stewart & Sons, Amsterdam, N. Y., manufacturers of underwear, knit goods, jersey cloth, etc., for the construction of a new plant to be located at Corinth, N. Y. The structure will be two-story, about 80 x 100 feet, and is estimated to

cost $50,000. Construction work will be inaugurated at once, it is understood.

The Olympian Knit Goods Company, New Hartford, N. Y., has filed notice of an increase in its capitalization from $300,000 to $700,000, to provide for general business expansion. The company specializes in the production of knit underwear and sweaters.

The plant of the Lehighton (Pa.) Knitting Company, manufacturer of women's knit underwear, was destroyed by fire recently with loss estimated at about $20,000.

The C. & T. Knitting Mills, Lansdale, Pa., has been organized by L. I. S. Conway and William Thielens, Philadelphia, to operate a plant for the manufacture of women's hosiery. The company has completed negotiations for the acquirement of a factory building at Lansdale under lease, and plans for remodeling are being prepared to suit the new line of business. It is proposed to install machinery and equipment for operation at the earliest possible date.

The West Branch Knitting Company, Milton, Pa., has increased its capital from $100,000 to $250,000 for general business expansion.

The Southard Knitting Company, Walton, Delaware County, N. Y., has recently increased its capital from $50,000 to $150,000, for business expansion.

The Columbia Knitting & Manufacturing Company, Milwaukee, Wis., is rushing to completion the construction of the new one-story and basement plant to be used for increased operations. The structure will be about 115 x 225 feet, and is estimated to cost in excess of $100,000.

The Alpine Knitting Mills, Pittston, Pa., has recently completed negotiations for the acquirement of a two-story factory building in the North Scranton district. It is understood that the new owner is planning to equip the structure with necessary machinery, etc., and utilize as a branch manufacturing establishment.

Ground has already been broken by Ritter & Brothers, Fleetwood, Pa., manufacturers of knit goods, on the erection of a large new addition to their local plant, for increased operations.

The New Haven (Conn.) Knitting Mills, recently incorporated with a capital of $50,000, has completed negotiations for the purchase of a two-story factory building located at 69 Poplar Street, about 38 x 130 feet, for its new plant to be devoted to the production of hosiery, underwear, etc. The company is making rapid progress on the installation of machinery and equipment, and it is understood that operations will be inaugurated at the earliest possible date.

The Pauline Knitting Mills, Inc., Valdese, N. C., have been formed with an authorized capital of $125,000.

The Best Hosiery Mills, Inc., Hickory, N. C., have been incorporated with $150,000 authorized capital by C. S. Grove, W. C. Taylor and D. L. Martin.

Five silk hosiery mills, each with a daily capacity of 1,500 dozen pairs of hosiery, will be built at Pennington Gap, Norton, Big Stone Gap, Gate City, and Appalachia, Va., by the F. Y. Kitzmiller Company, of Bechtelsville, Pa.

The Louisville (Ky.) Knitting Company has been organized with a capital of $75,000. A daily capacity of 400 dozen pairs of hose is contemplated.

The Nick-a-Jack Hosiery Mills, Chattanooga, Tenn., has doubled its capital stock, increasing it from $100,000 to $200,000.

The P. H. Hanes Knitting Company, Winston-Salem, N. C., has purchased a building at Reidsville, N. C., and will erect an underwear knitting mill there.

The Shoaf-Sink Hosiery Mills have been incorporated at Lexington, N. C., with a capital of $100,000, by H. F. Shoaf and I. L. Sink. Construction work will begin in the early spring.

The Harris-Covington Hosiery Mills have been incorporated at High Point, N. C., with a capital of $250,000, by J. W. Harris and W. C. Covington.

Alligator Lacing Attracts Attention.

It is interesting to note the claim that many manufacturers of belting are now advocating the use of Alligator steel belt lacing with their products. It is said there are several reasons why belt makers recommend this steel lacing. Probably the most important is the feature of time saving. While cemented belt ends have great strength, the requirement of time and the services of an experinced belt man have reduced the use of cemented belts in many places.

Leather lacing is still in general use, but is losing favor to some extent because of the difficulty and delay in making the joint and because of the low proportion of strength which the lacing gives when compared with the belt. Alligator steel belt lacing has the advantage of time saving, and is thoroughly adaptable to use on all belts and pulleys of both large and small diameter.

Belt users realizing these facts have made so many demands on the Flexible Steel Lacing Co., 530 S. Clinton St., Chicago, that they inform us that deliveries are now somewhat behind, but they give further assurance that their production capacity will be increased shortly and that they will be greatly pleased to give full information regarding the product, including prices, samples and delivery to anyone who makes inquiry of them.

"Atlantic Blacks."

This is the title of a sample book being sent out by the Atlantic Dyestuff Company, 88 Ames Bldg., Boston 9, Mass., distribution of which is being made to sulphur black users in America. This is perhaps the first sample book issued by a dyestuff manufacturer carrying formulae from actual users of the color treated and is perhaps the most complete treatise that has been prepared by any dyestuff manufacturers, either in America or Europe, dealing with one single color. All the samples shown in this book, with the exception of the yarn dyeings, are dyehouse dyeings.

The Morse Chain Company, with headquarters at Ithaca, N. Y., has announced the removal of its office at Greensboro, N. C., Geo. W. Pritchett, southeastern representative, to 404 Commercial Bank Building, Charlotte, N. C. Mr. Pritchett has been made manager of the company's business in the entire southern section and will direct it from the new Charlotte office. H. E. Matthews continues with the company in the new headquarters.

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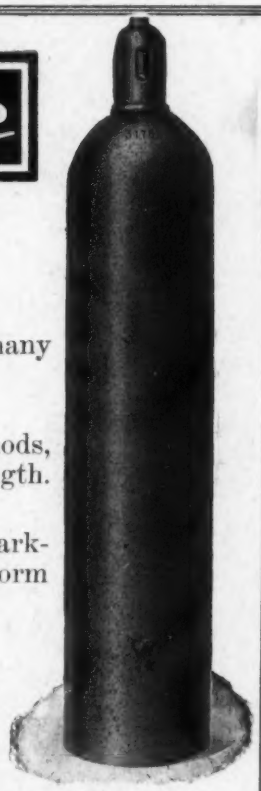

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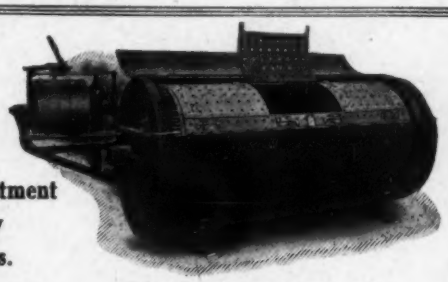

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and large output are the normal conditions which are obtained wherever

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are employed. The speedy and extensive production characterizing the large Textile Plants throughout the country is, in almost every instance, due, in a large degree, to the prompt shipments and constant employment of Tolhurst Extractors.

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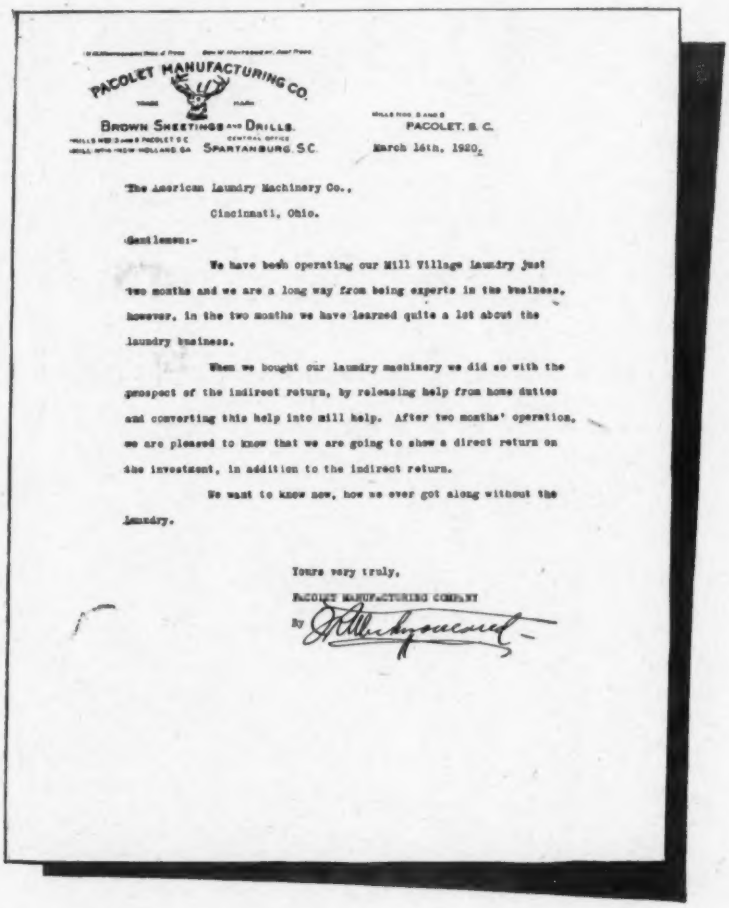


PACOLET MANUFACTURING CO.

BROWN SHEETINGS AND DRILLS.

PACOLET, S. C.

SPARTANBURG, S.C.

March 16th, 1920.

The American Laundry Machinery Co.,
Cincinnati, Ohio.

Gentlemen:-

We have been operating our Mill Village Laundry just two months and we are a long way from being experts in the business, however, in the two months we have learned quite a lot about the laundry business.

When we bought our laundry machinery we did so with the prospect of the indirect return, by releasing help from home duties and converting this help into mill help. After two months' operation, we are pleased to know that we are going to show a direct return on the investment, in addition to the indirect return.

We want to know now, how we ever got along without the Laundry.

Yours very truly,

PACOLET MANUFACTURING COMPANY

By

How Washday Lay-offs Were Ended in Pacolet

The experience of The Pacolet Manufacturing Company, as told of in the above letter, is in line with that of every manufacturer who has installed an American Mill Village Laundry.

It ends washday lay-offs—and it ideally solves one of the greatest problems of the mill owner.

Your inquiry will bring immediate and complete information at no cost to yourself.

The American Laundry Machinery Co.

Specialty Dept. C, Cincinnati, Ohio

ANNOUNCEMENT

Competition Among Manufacturers of Zeolite Water Softeners Assured

Refinite Company Discloses Evidence To Invalidate Patent

Plantiff Would Withdraw Suit Against Refinite

IN COURT at Buffalo, N. Y., a suit is pending against a user of the Refinite Water Softener and against the Refinite Company, manufacturer of this system. Infringement of patent rights claimed to have been granted under the name of a German inventor, is alleged.

This suit was filed, as most users of the Refinite system know, following a long period during which such action was openly threatened against and held as a club over, purchasers and prospective purchasers of Refinite Water Softeners.

In legal controversies of this nature courts have established that a basic patent on a device described in a printed publication two years before the patent is applied for, **is not valid.**

Evidence has just been disclosed proving that the type of water softening equipment attacked in this suit was described in such a publication at least three and one-half years before the date of application for the patent sued on.

SO CONCLUSIVE IS THIS EVIDENCE THAT THE PLAINTIFF HAS SIGNIFIED ITS WILLINGNESS TO WITHDRAW THE CHARGES AGAINST REFINITE, under certain conditions. The conditions, however, would be unfair to the trade and the consumer, as is explained later in this announcement.

Why This Interests You

Prior to the competition created by the Refinite Company, the zeolite water softener field was practically controlled by one manufacturer. Prices of water softeners utilizing such mineral were very high.

The Refinite Company, due to its use of Nature's own water softening mineral, Refinite, was enabled to put on the market a really efficient and satisfactory system at a moderate and fair price.

Forthwith began a campaign of threats and intimidation. It was directed, not at the manufacturer of the Refinite system, but at users and prospective users. Many Refinite owners were urged to supplant their Softeners with another company's system, even at a big expense, as the only way to escape heavy legal penalties; prospective purchasers were told that selection of the Refinite Softener meant prosecution and damages.

REFINITE
RIVAL OF THE CLOUDS
TRADE MARK

Nature's Water Softener

Copyright 1920, The Refinite Company

At the same time propaganda of calumnies and falsehoods about Refinite were spread.

EXTRAORDINARY

Such underhand and unfair business methods served only to make the Refinite Company more determined to "break open" the zeolite water softener field. By guaranteeing full protection against any possible loss from infringement action, it forced the issue until finally suit was filed.

The Refinite Company immediately took complete charge of the defense, as it had promised, and became a party to the suit. Delay followed delay. Meanwhile the campaign of intimidation directed against the trade continued.

Offers to "Make a Deal" with Refinite Co.

When proof was presented that water softening equipment of this type was in use long before the patent was applied for, the Refinite Company demanded that the plaintiff withdraw the charges or go to immediate trial. The plaintiff proposed instead the following:

> That the suit against the Refinite Company and the Refinite user be dropped but the plaintiff be allowed to continue its suit against another manufacturer and to validate its patent claims; and the Refinite Company then be allowed to operate under the patent or under a license.

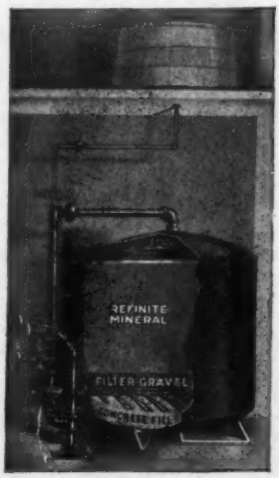
Refinite Company To Play Fair with the Trade

Such an arrangement would mean, of course, that the owner of the patent and the Refinite Company could manufacture and sell water softening equipment using zeolites. All others would be infringers. The field would virtually be monopolized, competition stifled, and prices could be boosted to—well, whatever levels these companies desired. The trade and the public—you who need soft water—would suffer.

The Refinite Company refused, and it herewith assures you that it will never enter into any such cabal.

* * * * * *

The Refinite Company realizes that lawsuits and other differences between business rivals ordinarily are of little interest to the public. Yet this instance, we feel, is an exception. You are interested in soft water. You want the best water softener to be had, you want the development of this science continued and you DO NOT WANT to pay more than a reasonable price for such service. Therefore, we consider it our duty to give you the facts and advise you as to the status of the infringement suit.



We know there have been a few prospective purchasers of Refinite Water Softeners who have been intimidated by the threats of suit. But we are pleased to find that hundreds of others were not. The business of the Refinite Company has shown a very gratifying increase every month over the previous month since the beginning of the fight.

Refinite engineers are at your service at any time, without obligation whatsoever on your part, to confer with you about a Refinite system for your use. Address our nearest office and one will call. And until the legal action referred to above is finally settled, the Refinite Company will be very glad to furnish you full protection (surety bond if desired) against any possible expense resulting from such a suit.

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Automatic Raw Stock Carbonizing Machines

Automatic Yarn Drying
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Truck Dryers for Yarn
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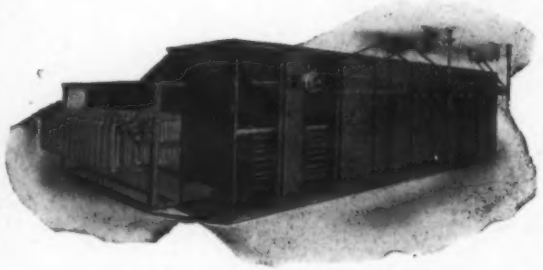

Automatic Dryer for all kinds of yarn.

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COCKER HOSIERY DYEING MACHINE

THIS machine has been thoroughly tested out with all colors and under all conditions, and is guaranteed to give the very best results possible in the dyeing of hosiery.

The stock is carried in four perforated metal containers equipped with one removable head on each container, and the containers mounted on Spiders in such a manner as to permit of their being loaded and unloaded quickly from the machine.

The Spiders carrying these containers are revolved in the vat *in one direction.*

Machines are furnished with either belt or motor drive.

Points of Advantage in This Machine That Must Be Considered

1st—Matting and chafing of the stock is entirely eliminated.

2nd—Percentage of re-dyes is reduced to a minimum.

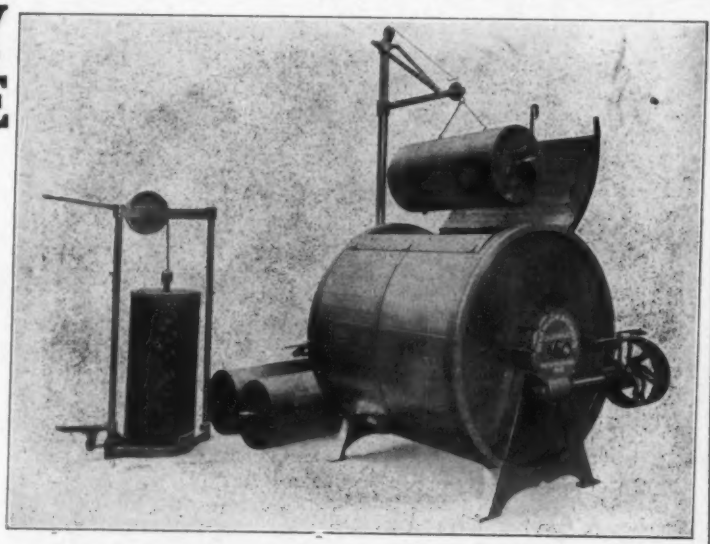
3rd—Different sizes and descriptions can be handled in one dyeing without confusion.

4th—Time required for loading and unloading machine reduced to a minimum.

5th—Absolutely level dyeings on all colors.

6th—Minimum of power required for operation.

For further particulars and prices write or wire.



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Builders of Textile Machinery.
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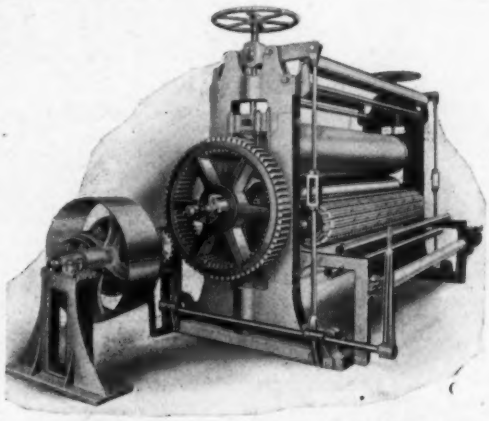

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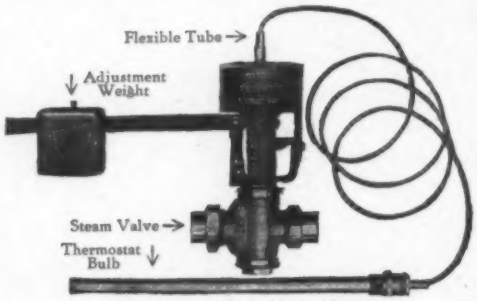

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A man's eye watching the thermometer. A man's hand turning the valves. He does his absolute best, but you know that his results are not uniformly right—because at some point there was too much or too little heat.

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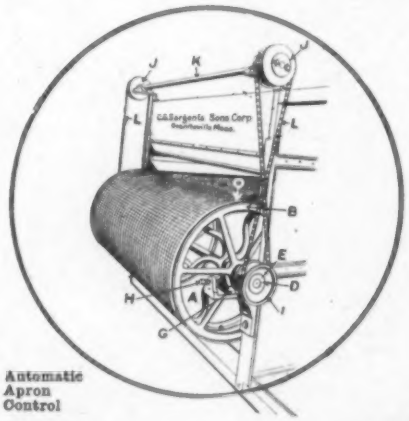
(1154) The Canadian Powers Regulator Co., Ltd., Toronto, Ont.



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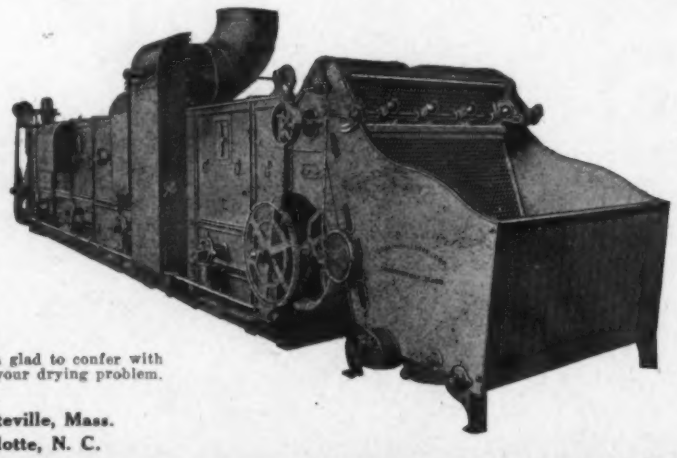

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Our Southern representative will be more than glad to confer with you and give every assistance possible in solving your drying problem. Write today for catalog.

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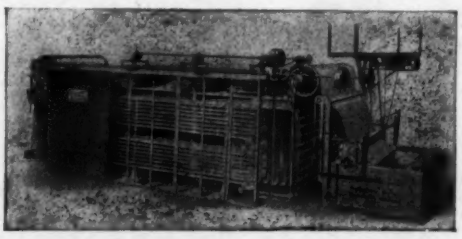
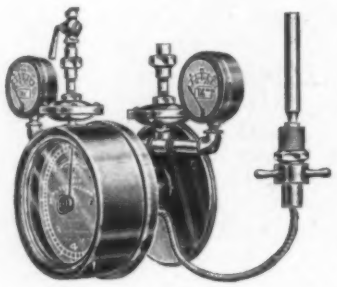


Proctor Cloth Shrinking Machine for all kinds of suitings and other textile fabrics.

197



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"No other single process has so direct a bearing on the quality of your final product. No other process, if carelessly done, causes so much trouble in the weaving department."

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The sizing mixture must be exactly right; the temperature in the size box must be held **steady and uniform.** In no other way can you prevent harsh, matted fibres totally lacking in tensile strength.

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Given the right mixture and a TAG Perfect Temperature Controller, sizing will take place under ideal conditions. You can spend more time on the interesting features of textile manufacture.

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The Color Fade-Ometer Gives You the Same Advantage as Natural Sunlight in Determining Whether Colors Are Fast or Not.

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THERE are in America, in the textile, paper, leather and allied industries, 67,585 *separate* establishments dependent, directly or indirectly, upon regular and uninterrupted supplies of dyestuffs.

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Conserve the Cotton

Cotton costs too much to be scrapped on account of oil spots, uneven dyeing and tender bleached goods.

The Remedy

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KIER OIL

Dissolves the natural oils and waxes in cotton, also combines with the mineral oil stains from the machines, making the oil soluble and easily boiled out before bleaching and dyeing—thereby reducing the amount of seconds and waste.

Wetting out or boiling out in Hydroxy Kier Oil before dyeing produces even shades—because the oils and waxes are removed allowing the dye to penetrate evenly.

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We know and can provide the proper type of Starch.

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Made by

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SOLD IN AMERICA

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"CIBA" Blue, Violet, Red, Scarlet and Bordeaux
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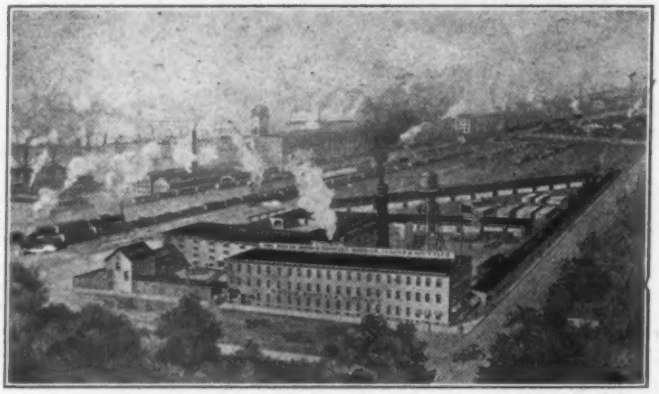

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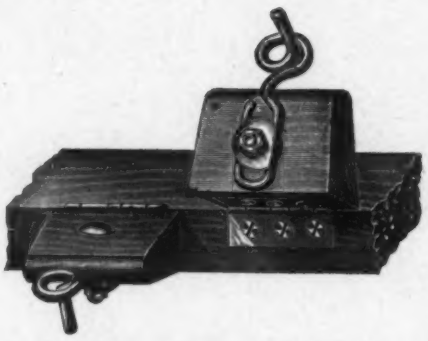

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THE I. E. PALMER COMPANY

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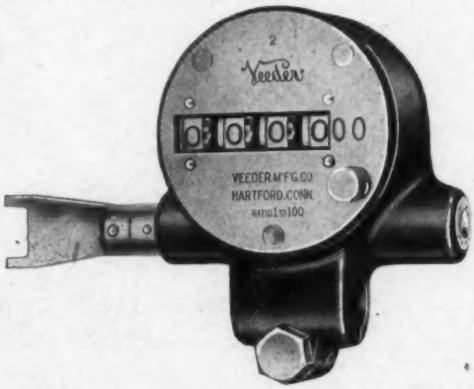
The able worker's example is a force you should utilize; his records influence his fellows; they're the standard to measure up to.

Good work is emulated, slack work condemned where

Veeder
COUNTERS

hold up before *all* the workers the individual records of each one of them.



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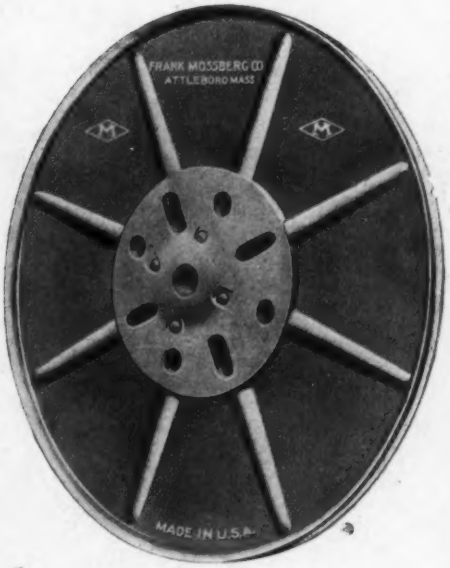
Mossberg Pressed Steel Construction is being used by mills the country over with a resulting saving of money and time

We will gladly send you our catalogue of Pressed Steel Beams, Reels, and Spools. This book takes care of practically all winding and reeling requirements.



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—IN ANY SIZE OR STYLE AT ONLY—

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HIGH GRADE LEATHER BELTING

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Compared with			
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The machine without limitations or restrictions.

Also the JUMBO MODEL,—cutting 1¾" letters. Used by Hundreds of Exporters.

You may try the DIAGRAPH before you buy it.

Write us for further information.

J. R. REGNAS & CO., Atlanta, Ga.

Sole Southern Distributors.

HOUSED MODEL

Sizes ½" & ⅞"

TEXTILE SCALES

No. 5005. Gives yards per pound
No. 5000. Gives ounces per running yard
No. 5010. Gives yarn number for cotton yarns
No. 5015. Gives yarn number for woolen yarns
Used by U. S. War and Navy Depts.
CHRISTIAN BECKER'S ANALYTICAL AND SILK BALANCES
THE TORSION BALANCE CO.
Main Office, 92 Reade Street, New York
FACTORY: Jersey City, N. J.
BRANCHES: 31 W. Lake St., Chicago. 49 California St., San Francisco.

THE JOHNSON FRICTION CLUTCH

Single Clutch Exterior.

A light powered clutch of correct design and superior quality, for use with standard pulleys wherever a flexible power control is required.

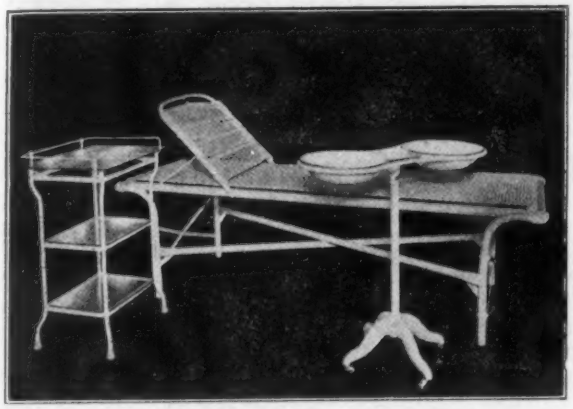
Made in both single and double types, extremely simple, compact and durable in construction. Adaptable to all speeds and conditions.

The Johnson Clutch has been widely adopted for line-shaft drives in textile plants, and has been successfully incorporated into textile machinery of all kinds.

Write for our Catalog "G."

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

F. H. Thomas Co.
Boston, Mass.



A First Aid Room or an Emergency Hospital for Your Employes will

Decrease your liability for industrial accidents.

Decrease time lost through temporary incapacity of your workers.

Decrease needless suffering from minor injuries and prevent minor injuries from developing into serious cases.

Increase morale and loyalty among your employees and give you opportunity to show your interest in the welfare of your workers.

The F. H. Thomas Company has equipped First Aid Rooms for over four hundred factories and mills, who have appreciated these facts, including the following Southern mills:

WINSBORO MILLS Winsboro, S. C. **WATEREE MILLS** Camden, S. C. **WHITNEY MILLS** Whitney, S. C.

A modern Thomas equipped emergency room will put you also among the progressive owners who are saving money and advancing the conditions of their workers.

Write for information and advice, stating, if possible, the number and nature of your accidents. Southern Representative.

F. H. Thomas Co.
689-691 Boylston St.
Boston, Mass.

The Standard for Quality and Service

Receptacles

Diamond Fibre Mill Receptacles combine great strength with light weight—a construction that gives splendid, lasting service under the hardest usage.

Diamond Fibre Receptacles do not dent, splinter, crack or break. The interior surface is smooth and flawless. The color is incorporated in the material which, therefore, does not chip, nick, or rub off.

Thirty years of experience stands behind each Diamond Fibre Receptacle. Each receptacle is carefully designed for the work it is to perform.

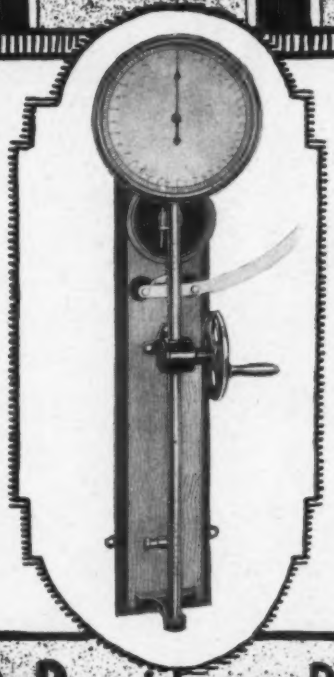
Standard sizes, or made to any specifications. Prices and complete information on request.

Dept. W. Z.

Diamond State Fibre Company

BRIDGEPORT, PA., (NEAR PHILADELPHIA,) U. S. A.
In Canada—Diamond State Fibre Company of Canada, Ltd., Toronto, Canada

SCOTT TESTERS



"It is no longer necessary to go abroad to procure accurate testing equipment"

Everyone knows the old style hand operated yarn tester. Its fundamental principle of a swinging weight has long been recognized as superior to all other methods of construction. This type of testing in greatly improved form is still used extensively and with the Scott improvements is capable of very satisfactory and accurate results.

Our patented power operated and automatic machines for both yarn and cloth testing are a revelation to the man who is familiar with this type only.

Let us tell you about our modern testers. Illustrated literature on request.

HENRY L. SCOTT & CO. Providence, R.I.

MAKE
THE AIR PLEASANT IN YOUR MILL

Improving the working conditions in your mill means better work—greater output—less time lost—

Fredisco TRADE MARK

HUMIDO OIL "SOLUBLE"

Is made from Pure Steam Distilled Pine Oil

1 to 2 quarts a day in your Humidifier System will give the air a clean Pine Odor.

It is stimulating. Has no gum or rosin in it.

Write for sample—if you are not using it.

Manufactured Only by

Frederick Disinfectant Co.

Manufacturing Chemists

ATLANTA, GA.

Acme DOORLESS Baler

Patents Pending

A 1100 lb. bale of mixed waste paper occupies 27 by 27 inches floor space, 1200 lb. bale of rags 27 by 30 inches. Consider the large saving in storage room and the greater quantity you can load in cars. Built in numerous sizes and pressure capacities.

Galland-Henning Mfg. Company

MILWAUKEE, WIS.

SOUTHERN SALES REPRESENTATIVE:

THE LOVINGOOD COMPANY, Atlanta, Ga.

ALVIN LOVINGOOD, President. JAMES A. GREER, Secretary & Treasurer.

THE LOVINGOOD COMPANY, Inc.

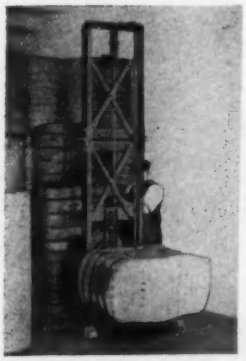
14 WALKER STREET "SERVICE—PLUS" ATLANTA, GEORGIA

SHIPPING ROOM AND FACTORY SUPPLIES

NEW ORLEANS COTTON TRUCK

REVOLVATOR

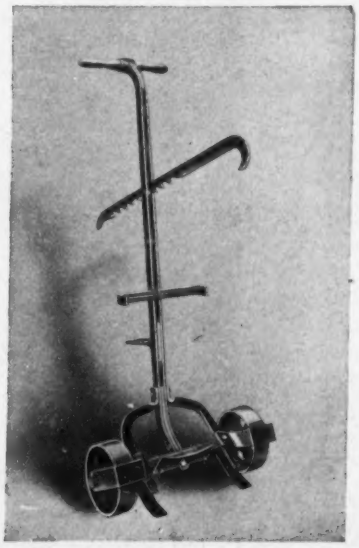
WRITE FOR PRICES



WRITE FOR PRICES

The REVOLVATOR—portable elevator increases storage space 500 per cent.

McKINNEY ONE-MAN TRUCK



Leatheroid

MILL RECEPTACLES

The Truly Permanent Fibre Cars

Leatheroid No. 3 All Fibre Car. Solidly Built. All wearing surface protected.

Leatheroid cars, as all Leatheroid receptacles, are made of "Leatheroid"—the most durable and toughest, smooth fibre known, and the other parts are chosen with care, and put together right.

Leatheroid Cars stand the heaviest loads and roughest usage day after day, year after year, and then show very little effects of wear.

Leatheroid Cars, Roving Cans, Boxes, Baskets, etc., are made in all sizes and shapes.

Sold by Leading Southern Mill Supply Houses.

Rogers Fibre Company
Leatheroid Sales Division
1024 Filbert Street, Philadelphia

Leatheroid No. 2 Steel-Clad Car. Nothing Equals it for Construction, Finish and Serviceability.

MAKE
THE AIR PLEASANT IN YOUR MILL

Improving the working conditions in your mill means better work—greater output—less time lost—

Fredisco TRADE MARK

HUMIDO OIL "SOLUBLE"

Is made from Pure Steam Distilled Pine Oil

1 to 2 quarts a day in your Humidifier System will give the air a clean Pine Odor.

It is stimulating. Has no gum or rosin in it.

Write for sample—if you are not using it.

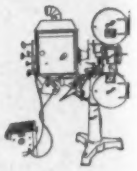
Manufactured Only by

Frederick Disinfectant Co.

Manufacturing Chemists

ATLANTA, GA.

Simplex
PROJECTORS



ARE THE TYPE MOVING PICTURE MACHINE TO BE FOUND IN THE WORLD'S FINEST THEATRES, SCHOOLS, CHURCHES AND INDUSTRIAL PLANTS—IF YOU CONTEMPLATE INSTALLING PICTURES IN YOUR RECREATION HALL IT WILL BE TO YOUR ADVANTAGE TO LET US FIGURE WITH YOU—REMEMBER! WE CARRY A GIGANTIC STOCK OF MACHINES, SCREENS, CHAIRS AND EVERYTHING PERTAINING TO THE THEATRE, SCHOOL OR AUDITORIUM. WRITE FOR COMPLETE CATALOGUE AND DETAILED INFORMATION. WE EMPLOY A CORPS OF EXPERTS AND ARE AT YOUR SERVICE—MANY YEARS OF SUCCESSFUL OPERATION THROUGHOUT THE COUNTRY HAS BEEN ENJOYED BY THIS COMPANY.

SOLE SOUTHERN DISTRIBUTORS Simplex TRADE MARK PAT'D PROJECTORS

THEATRE ACCESSORIES
LUCAS THEATRE SUPPLY COMPANY
ATLANTA, · GEORGIA

"AMERICA'S GREATEST INDEPENDENT MOTION PICTURE MAIL ORDER HOUSE"

Dependability! Accuracy!::::

Above all else, "The Standard" Scales are accurate.

In addition, they are rugged, and lend themselves readily to the problems which confront the textile plant, storage warehouses and baling plants.

"THE STANDARD" AUTOMATIC DIAL SCALE is dependable—a time and labor saver. It is constructed entirely of metal and set flush with the floor. Correct weights show up instantly. Figures are bold and clear with plenty of spacing between. Tare beam allows for truck. Made in capacities of 2 lbs. to 10,000 lbs. New catalog tells all about our complete line—a scale for every need.

The Standard Scale & Supply Co.

1631 Liberty Ave., Pittsburgh, Pa.
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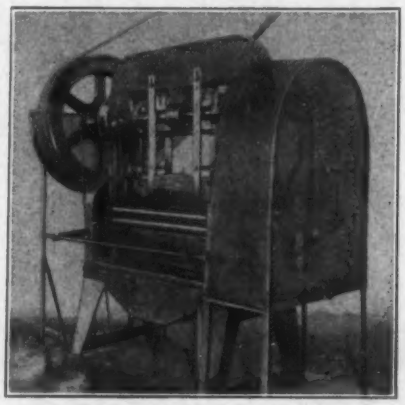
Cleveland Baltimore Dallas

Beckley Perforating Co.
14 North Ave.
Garwood, N. J.



STEEL surfacing for sand rolls, Drying machines and ovens, Copper and brass centrifugal liners, Sheet steel for machinery guards, Steel vats, Kettles and Tanks, electrically welded.

SOUTHERN AGENTS

WILSON COMPANY, GREENVILLE, S. C.

Modern Playgrounds Better Communities

Leading industrial concerns recognize the value of the playground, not only to their community, but to their institution as well. Add to the health and happiness of an employe's growing children, and you give to that employe an added happiness and contentment that he carries with him to his work. You promote loyalty, good will and genuine interest.

MEDART
PLAYGROUND EQUIPMENT

For 50 years the Medart Company has been manufacturing and perfecting gymnasium apparatus for vigorous men—an experience that has especially fitted it for the leadership it has always maintained in the development of playground equipment best suited to promote those bodily and mental qualities which mold today's childhood into tomorrow's man- and womanhood.

Send for Catalog "L."

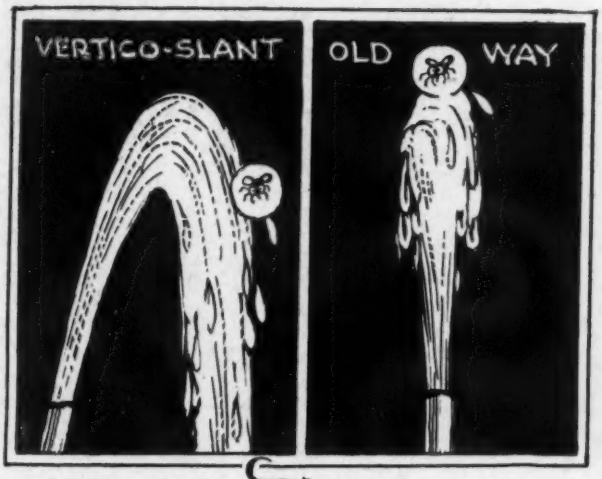
Catalog "L" fully describes Medart Playground, Swimming Pool, Gymnasium and Locker Room Equipment. Contains valuable suggestions for playground installations. It will be sent gladly to anyone requesting it.

Fred Medart Manf'g. Co.

Potomac & DeKalb Sts.

St. Louis, Mo.

Gordon Lewis, District Manager, Walton Bldg., Atlanta, Ga.



"Bacteria Dance" Doomed *"On With the Dance"*

The VERTICO SLANT

Rid Your Drinking Fountains of the Danger of Bacteria

Prof. Clark, of Wisconsin University, demonstrated that bacteria remains in the vertical stream fountain from 2 to 135 minutes. This has since been verified by Prof. Dunlap, of the University of Iowa, and several others.

Streams of decided slant are impractical to drink from on account of their hose-like force, and fountains with hoods give a resting place for the corner of the mouth and consequent contamination.

The "Vertico-Slant"

Is a fountain that overcomes these objections. The mouth comes in contact with the stream at a point where its momentum is lost; lips cannot touch the nozzle, which is raised slightly above the sloping base of recess.

Uses less water than the old-style drinking head; reduces opportunity for squirting and tampering.

GLASS OR CUP CAN BE FILLED AS READILY AS FROM A FAUCET.

Pure white vitreous china—easily cleaned—no sharp corners or crevices. Write for our new catalog "C," which gives full details.

RUNDLE-SPENCE MFG. CO.
MILWAUKEE, WIS.

BIG BUSINESS

AND THE WAY TO IT!

BIG business has long since recognized that the employee is a very important factor in success and that good health and contentment among employees makes for Greater Efficiency—Speeds up Production—Produces a Smoothly-running organization.

LUNCH ROOM

Lunch rooms for employees have proven in every instance to be a great step in the direction of an operating force that is always "on the job," frictionless, reducing mistakes, eliminating waste and preventing loss of time.

Permit us the opportunity of taking this matter up with you further and let us help you solve some of your biggest problems by installing a cafeteria or a lunch room in your factory for your employees. We are prepared to furnish you without obligation on your part practical blueprint layout of your kitchen and dining room showing complete installation of a modern, up-to-date, sanitary cafeteria or lunch room. We are prepared to make immediate shipments of all equipment from our stock in Atlanta.

Write for our 300-Page fully Illustrated Catalogue.

The WRIGHT goods, the WRIGHT price, the WRIGHT service.

THE WRIGHT CO., Inc.,

Importers and Jobbers

Hotel, Restaurants and Institution Equipment

185 Peachtree Street ATLANTA, GA.

Wright GOODS-PRICES-SERVICE

A New Addition to Our Service

We have just installed a complete Belting equipment to re-work your old Belts. This is a large saving to quantity users of Leather Belting. Let us demonstrate to you the value of this saving.

We carry a complete line of

TEXTILE and GENERAL MILL SUPPLIES

The Mill Supply Co., Inc.

Greenville, S. C.

Efficient Conveying and Storage Equipment Will Cut Down Your Labor Costs.

Several years of specializing on conveying and storage equipment for cotton mills enable us to solve your problems in an intelligent way, to suggest the most efficient equipment for the work you have to do.

Without obligation on your part, one of our representatives will be glad to call and tell you frankly what our equipment can do for you.

REPRESENTATIVES FOR

Economy Engineering Co., Tiering Machines.
Automatic Transportation Co., Storage Battery Trucks.
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Berger Mfg. Co., Steel Lockers and Bins.

"Serving Southern Concerns"

J. D. COLLINS,

9th Floor, Grant Building, ATLANTA, GA.

Have You Received Your Copy?

This Book May Be an Eye Opener to You, Gentlemen!

It requires no stretch of imagination to picture the contentment of employees that are provided with outdoor and indoor gymnasia and athletic goods, nurseries and playgrounds.

Your eyes are already open to the advantages of such—to the fact that it goes a long way toward solving the labor problem and increasing production.

But perhaps the question in your minds are just what sort of equipment and athletic goods you require and where to buy the best. Our catalog, fully illustrated, will be an eye-opener to you and give you the information you want. It shows the FUN-FUL line—including Swings, Slides, See-Saws, Ocean Waves, Giant Strides, Outdoor Gymnasia, Athletic Goods of all kinds.

Three generations of expert mechanical skill and experience together with an intimate knowledge of what is required for the best playgrounds enables us to offer the FUN-FUL line without apology.

Over 240 mills are now using FUN-FUL Equipment. If the book doesn't give you all the information you want, we will be only too glad to help you plan playgrounds or gymnasiums or furnish you with special plans.

Write today for your copy.

HILL-STANDARD CO.

Sales Office: Conway Bldg., Chicago, Ill. **Factories: Anderson, Ind., and Kokomo, Ind.**

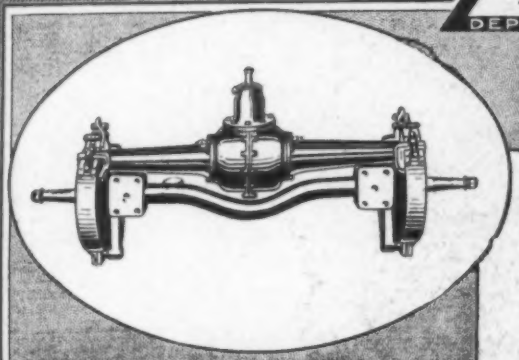
THE FUN FUL LINE
PLAYGROUND EQUIPMENT

TRI-ANGLE

POWER SERVICE MOTOR TRUCK DEPENDABILITY

A Three-Fold Value

¾ · 1½ · 2 Special & 2½ Ton Models



Separate Load-Carrying Axle

The TRIANGLE load-carrying member has no connection whatever with the driving member.

It is forged from a solid piece of 1½% chrome nickel axle steel heat treated. Its **only** function is to **carry the weight.**

It is easy to see that a solid one-piece forging of this kind is much stronger and safer than an axle formed of hollow castings made thin for lightness.

It's just like your horse—he can easily **pull** much more than he can **carry.**

So strong, indeed, is the TRIANGLE axle that combination axles of equal capacity weigh 20% to 40% more.

Your territory may still be open. Address or write Dept. Z

Eastern Representatives
TRIANGLE MOTOR SALES CO.
381 Fourth Ave. New York City

New England Distributors
Eugene F. Lally and Sons Co.
Boston, Mass.

TRIANGLE MOTOR TRUCK COMPANY
St. Johns, Michigan

Holyoke Transfer System

Soon Pays For Itself

HOLYOKE TRUCK COMPANY — EFFICIENCY QUALITY SERVICE — HOLYOKE MASS

Consider this: six minutes to load, four minutes to unload (average time) old style trucks, and compare it with the quarter of a minute it takes a Holyoke Truck to back under the skid and pick up its load plus another quarter-minute to deposit and clear. With a saving of 9½ minutes time on each truckload, the Holyoke Transfer System soon pays for itself. There are other advantages — distinctive ones—well worth investigating. Details in Bulletin.

Holyoke Truck Co.
119 Race St., HOLYOKE, MASS.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also proceed merit as surely in machinery as in men.

Time, skill and effort must also proceed merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY
ENGINEERS—FOUNDERS—MACHINISTS
PHILADELPHIA, PENNA.
Branch Office 141 Milk St., Boston, Mass. 20

Automatic Weighing

This picture shows a Kron Automatic Scale, platform type, in the plant of a large paper manufacturer.

Save

TIME—LABOR—MONEY

by installing

"Load and Look"

Kron Scales

AUTOMATIC Made in U. S. **SPRINGLESS**

All Metal Construction

There's a Kron for Every Weighing Purpose

ALL TYPES--ANY CAPACITY--Dormant or Portable, Hanging Pan Types, Overhead Track Scales, Suspension Crane Scales, etc.

Catalogue sent upon request

American Kron Scale Co.

422 East 53rd St., New York

Branch Offices and Service Stations in Principal Cities

Canadian Kron Scale Co., Montreal, Can.

MEECO

Metal Equipment For Shop And Factory

OUR LINES:

Sanitary Wash Bowls (in Batteries), Bubbling Fountains (Plain and Ice Cooled), Metal Lockers, Metal Stock and Pattern Storage Racks, Metal Shelving, Metal Cabinets, Vault Fixtures, Soda Kettles (40 and 60 Gallons), Metal Stools and Chairs, Water Mixers, Work Benches, Bench Legs, Full Line of Plumbing Fixtures, Etc.

EQUIPMENT Will Help You to Keep Labor Contented and Permanent

It is just such equipment as this that helps you to keep employees' good-will—that solves the labor problem by making them stay with you.

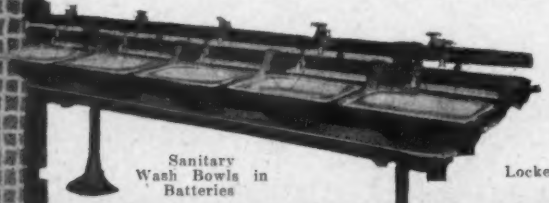
Employees appreciate clean, cool drinking water—clean wash basins, good clothes lockers, sanitary toilets, and the like, and you could make no better investment at this time than to seriously consider the installation of one or more of the MEECO Employe-Keeping Equipment.

MEECO Ice Cooled Drinking Fountains are now being used in hundreds of mills, as well as MEECO Steel Lockers, Sanitary Toilets, Wash Bowls in Batteries, Steel Chairs, etc.

Do Not Delay—Get complete catalog of this valuable equipment.

MANUFACTURING EQUIPMENT & ENGINEERING CO., 135 Federal St., Boston, Mass.

Address all letters to Framingham, Mass.



Sanitary Wash Bowls in Batteries

Lockers

BAY STATE

DIXIELITE

The Standard White for Mill Interiors. Made in Gloss, Semi-Gloss and Flat finish.

Write for samples and prices.

MANUFACTURED ONLY BY

Wadsworth, Howland & Co., Inc.

W. A. Williams, Southern Representative
P. O. Box 322, Greenville, S. C.

BOSTON, MASS.

THE HURST COMPANY

208 Austell Bldg.

Atlanta, Ga.

We Manufacture

Paints that are Specially Adapted to the South Country.

Best Roof Paint,
Best Rubber Roofing Paint, and
Best Bridge and Metal Paints.

SATISFACTION GUARANTEED.

Also Rubber and Slate Surfaced Roofing.

Make your inquiries to us.

Prices Cheerfully Quoted.

AGASCO ROOFING FELT

LASTS INDEFINITELY

—for the wide expanse of industrial roof that must be covered effectively but at moderate cost—Withstands the extremes of weather—Resists the elements.

We have it or will make it to suit almost any specification, if your order warrants that.

AGASCO ROOFING PITCH

—prolongs the life of your old roof
—Made according to YOUR specification.

AGASCO PAINTS AND CREOSOTES

ATLANTA GAS LIGHT Co

ROOM 235, 20 FAIRLIE ST.

HAMPDEN *SUNRAY* MILL WHITE OIL PAINT HELPS EYES TO SEE BETTER

N every mill there are workers whose imperfect eyesight operates like a brake on speed and production.

Walls coated with Hampden *Sunray* Mill White Oil Paint gather and diffuse a very high percentage of light, thus making it easier for those of poorer eyesight to keep pace on production.

Hampden *Sunray* Mill White forms a tough, elastic surface that is snow white, smooth as tile—and Washable.

Three Finishes:
Gloss, Egg Shell, Flat.

Deliveries direct from Factory or Local Dealers
Send for Booklet "WHITEST WHITE"

HAMPDEN PAINT & CHEMICAL CO.
Good Paint Makers for Over 67 Years
Division E, Springfield Massachusetts

Saving days and dollars when the job demanded action

THE Hoosac Cotton Mills, of North Adams, Mass., were running behind on deliveries. The trade demanded more goods—*quickly*. The owners consulted us. Circumstances clearly warranted building an addition immediately. We recommended *action*.

An old building obstructed the site. Part of the proposed addition would extend over a river. The water was high in early spring. Strong currents added an element of danger. But the job couldn't wait. Special arrangements were necessary. Lockwood, Greene & Co. were retained as manager-engineers. A competent engineer took charge, made contracts in our name and relieved the mill company of responsibility.

The emergency measures brought results beyond anticipation. Sixty days before schedule time the building was completed, *at a cost less than estimated*. Production was maintained, while work progressed, though we re-arranged machinery to consolidate the addition and the main plant.

BUILDING WITH FORESIGHT

Under our Manager-Engineer contract the owner deals with one firm only—Lockwood, Greene & Co. This saves time and money. Responsibility is definitely fixed. It can be applied to the particular work you have in mind. Write

LOCKWOOD, GREENE & CO.
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EXECUTIVE OFFICE, 60 FEDERAL ST., BOSTON

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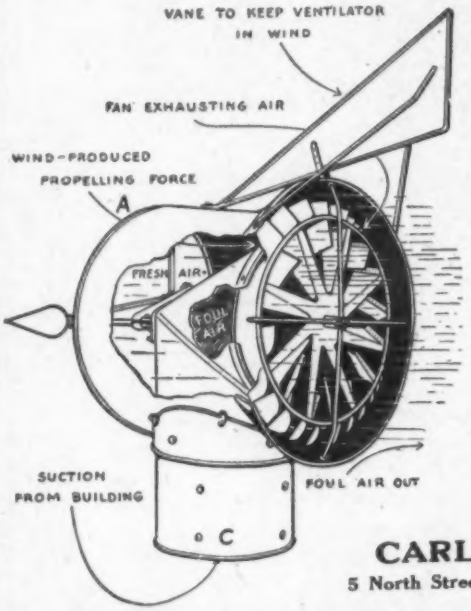
285 Beaver Hall Hill, Montreal, P. Q.
COMPAGNIE LOCKWOOD, GREENE
47 Ave. de l'Opera, Paris, France

The Wind Mill Principle Applied to a Ventilator

Note the illustration! The fresh air passing over the funnel comes in contact with the small outer blades, thereby propelling the wheel to which the large inner blades are also attached. These revolving inner blades create a vacuum which sucks the foul air from below. Perfectly simple—like so many of the world's ingenious inventions. The



Carlisle Force-Draft Ventilator

displaces from 5 to 6 times as much air as ordinary ventilators. You can replace your present inefficient Ventilators with fewer and smaller-sized "Carlisles" and get more ventilation!

Write for descriptive folders.

CARLISLE & GALE CO.

5 North Street Cambridge, Mass.

VOGEL PATENTED — **OVER 350,000** *Giving* *Satisfaction in All Climates*

FROST PROOF CLOSETS

They require no pit.
They save water.

All bowls have enameled rims. In service daily, winter and summer.

No. 1

The ideal water closets for Factories and Mill Villages, where thousands have been installed.

The most durable water closets made — excepting none.

Every Fixture Tested Under Hydraulic Pressure Before Leaving Factory.

INSISTON GETTING THE VOGEL

Ask your jobber

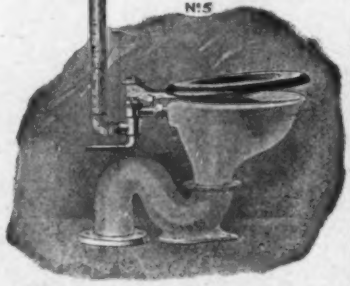
JOSEPH A. VOGEL CO.

Factory and Office at
WILMINGTON, DEL.

VOGEL PATENTED

No. 5 FACTORY CLOSET

This fixture fills the demand for a strong and durable automatic water saving closet outfit for factory use. The valve device is extremely simple and repairs, though seldom necessary, can be made by removing the valve cap back of bowl.



SPRAYLITE
An Oil Paint

Of a brilliancy that will bring the equal of brightest daylight into your work rooms and offices. It saves for your benefit every ray of light that comes through the windows and augments them with a whiteness that is almost dazzling. Just consider what this means in increasing production.

BRINGS GREATER PROFITS

With better light employees do better and more work, thus making fewer mistakes and have less spoilage or waste. Give us your wall areas and we will be glad, without any obligation on your part, to explain just what Spraylite will do for you as well as quote prices and the amount of product required.

MECHANICAL APPLICATION SAVES HOURS

The real expense in painting is not in materials cost but in the cost of labor. Using this machine with Spraylite solves the labor problem and at the same time there is no wasted material, it all goes on the walls.

FIVE TIMES HAND SPEED

In applying Spraylite the spraying machine will do in a few minutes time work equal to five men with the brush, and will make a smoother application. It requires but one operative to handle it and offers such a clean, fast, inexpensive method of dressing up the plant.

The Excello Manufacturing Co.
1836 Euclid Ave.
Cleveland, Ohio

Creosoting Industrial Timbers Is ECONOMY

CARBO, FIRST GRADE REFINED CREOSOTE OIL

Meets all requirements of the United States Government Shipping Board Emergency Fleet Corporation, Specification G174-A-1 and the United States Railroad Administration, Specification R-828-A.

The cheapest sap wood timbers, especially sap wood pine shingles treated with this oil **will outlast the highest grade woods untreated.**

NUMBER ONE CRUDE CREOSOTE:

An economical wood preservative for open tank or brush treating wood shingle roofs, or structural timbers. This material when properly applied greatly lengthens the life of the cheaper timbers.

PURE CREOSOTE DISINFECTANTS COEFFICIETS ONE TO TWENTY.

Each shipment tested by Ridell-Walker method and guaranteed as to carbolic strength.

Our standard disinfectants are free from sediment and tarry matter and upon dilution with water form rich, cream-like emulsions (no oily float on top nor deposit at bottom). Emulsions do not separate on standing.

Our disinfectants are manufactured by the largest Manufacturer of coal-tar products in America and are absolutely uniform.

Gulf States Creosoting Company
17 Sampson Street, ATLANTA, GA.

From Boll to Roll

Quality

Only high grade American cotton together with expert workmanship enter into the construction of STANLEY solid woven belting. There are no plies or laps to come apart when stitches break or glue dries out.

The result is strength, uniformity and flexibility.

Economy

STANLEY, while not cheap belting, is very economical because of the increased power transmission, reduced slippage and resistance to the effects of oil, moisture and heat. The stretch, under normal conditions, is removed once and for all within the first few days of operation.

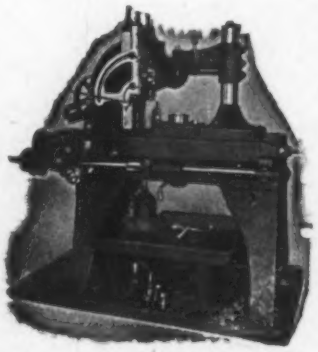
Sample on request.

STANLEY BELTING CORPORATION

36 Clinton St. **Chicago**

FULL AUTOMATIC, SEMI-AUTOMATIC and HAND OPERATED

Gear Cutting Machines!



Especially Adapted for Use in

Cotton Mills.

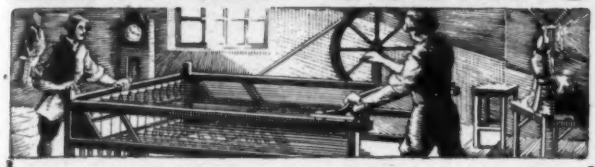
Hundreds Now in Use.

Send for special circulars.

The D. E. Whiton Machine Company

New London, Conn.

JEWELL LEATHER BELTING



Hargreaves Spinning Jenny 1776—
Jewell Leather was then used for Belting.

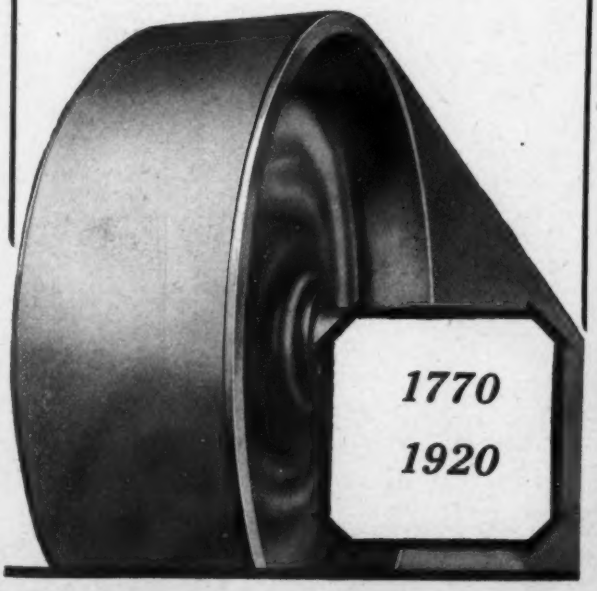
THE leather belting we have made for five generations of American manufacturers must have been good—

had it not been, we would be unable after 150 years, to put JEWELL on our belting, and be proud of it.

Hartford, Connecticut

Western Branch

2837 So. La Salle Street, Chicago, Ill.



CRESCENT BELT FASTENERS MAKE GOOD BELTS GIVE BETTER SERVICE

They sustain the belt's full strength

— the more prominent belting manufacturers recommend Crescent Belt Fasteners as the strongest, safest, most durable and most economical method for joining power transmission, elevating and conveying belting of every length width and thickness.

There's a Crescent booster near you. Write and we'll send you his name.

"They make good Belts give better SERVICE"

Write to Our
Cotton Mfgrs. Service Lept.
for full information how Crescents
will help you

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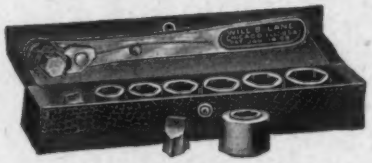
Lane's UNIQUE Ratchet Tools



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Consists of Ten Pieces

1—7-inch Ratchet Wrench (Drop-Forged)
2—Screw Driver Bits
7—Sockets—turned from solid round bar (Machinery Steel)—broached hexagon openings—fitting U. S. Standard Cap Screws 5-16 inch to 5-8 inch (except 9-16 inch) and Hexagon Nuts—1-4 inch to 1-2 inch (except 7-16 inch). S.A.E. Cap Screws and Hexagon Nuts 5-16 inch to 9-16 inch

Size of Socket Openings

1-2 inch fits { 1-4 inch Hexagon Nut / 5-16 inch Cap Screw
9-16 inch fits 3-8 inch Cap Screw
39-64 inch fits 5-16 inch Hexagon Nut
5-8 inch fits 7-16 inch Cap Screw
11-16 inch fits 3-8 inch Hexagon Nut
3-4 inch fits 1-2 inch Cap Screw
7-8 inch fits { 1-2 inch Hexagon Nut / 9-16 inch Cap Screw S.A.E. / 5-8 inch Cap Screw U. S.

Packed in strong Black Fibreroid Case
Weight 22 ounces

LIST PRICE, $3.50

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180 N. Dearborn St., Chicago, Ill.

Brazing—Oxy-Acetylene and Thermit

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Over ten years of practical experience in brazing and welding all kinds of machinery and equipment enables us to offer efficient service to the cotton and knitting mills.

Parts shipped to us welded and returned promptly.

Or wire us, and one of our first-class machinists and practical welders will come to your plant and weld your job for you.

Boiler Welding A Specialty

CHATTANOOGA BRAZING & WELDING CO.
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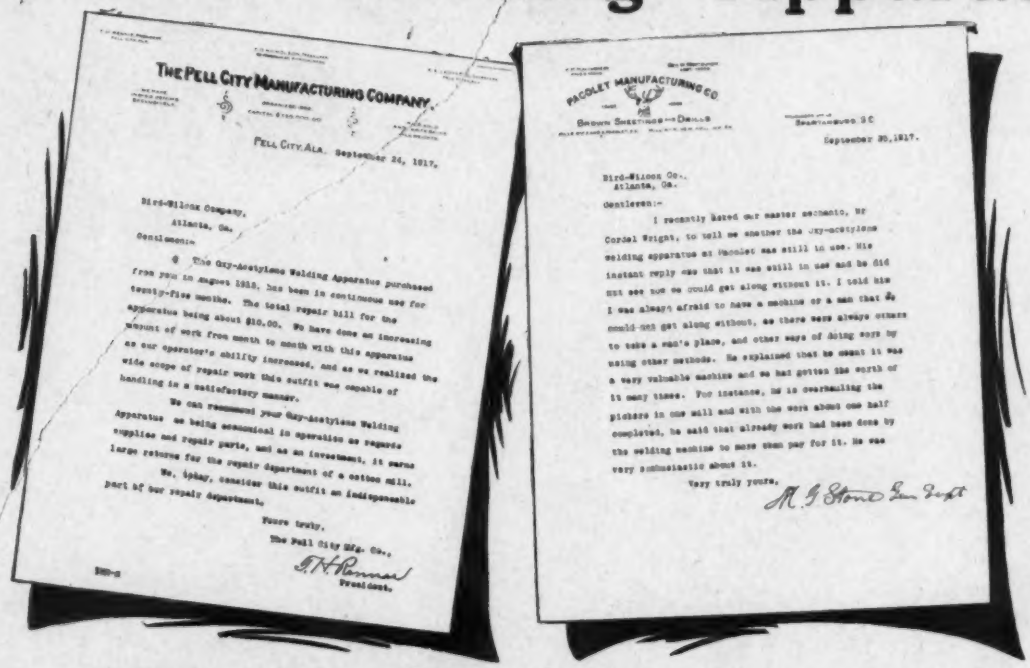
TRANSMISSION
APPLIANCES
Their Quality is always higher than their price.
VALLEIRON
The Valleiron Line is complete in every detail – every item has been tested by years in actual service.
The dealers who sell Valley Appliances share in our success by the great repeat business this line brings to them.
If you buy Power Transmission Appliances of any kind our new illustrated catalogue No. 110 will be useful to you.
Write for it.
VALLEY IRON WORKS
Williamsport, Pa.
ESTABLISHED 1865.

Standard Welding Apparatus



THE PELL CITY MANUFACTURING COMPANY.

PELL CITY, ALA. September 24, 1917.

Bird-Wilcox Company,
Atlanta, Ga.

Gentlemen:

The Oxy-Acetylene Welding Apparatus purchased from you in August 1916, has been in continuous use for twenty-five months. The total repair bill for the apparatus being about $10.00. We have done an increasing amount of work from month to month with this apparatus as our operators ability increased, and as we realized the wide scope of repair work this outfit was capable of handling in a satisfactory manner.

We can recommend your Oxy-Acetylene Welding Apparatus as being economical in operation as regards supplies and repair parts, and as an investment, it earns large returns for the repair department of a cotton mill.

We, today, consider this outfit an indispensable part of our repair department.

Yours truly,
The Pell City Mfg. Co.,
T. H. Ramsey
President.

PACOLET MANUFACTURING CO

Brown Sheetings — Drills

Pacolet, S. C. September 20, 1917.

Bird-Wilcox Co.,
Atlanta, Ga.

Gentlemen:

I recently hired our master mechanic, Mr Cordel Wright, to tell me another the oxy-acetylene welding apparatus at Pacolet was still in use. His instant reply was that it was still in use and he did not see how we could get along without it. I told him I was always afraid to have a machine or a man that we could not get along without, as there were always others to take a man's place, and other ways of doing work by using other methods. He explained that he meant it was a very valuable machine and we had gotten the worth of it many times. For instance, he is overhauling the pickers in one mill and with the work about one half completed, he said that already work had been done by the welding machine to more than pay for it. He was very enthusiastic about it.

Very truly yours,
A. J. Stone Gen. Supt.

Over 300 Cotton Mills Are Saving Money With Standard Welding Apparatus

More and more mills are realizing the uselessness of spending their good money for new machines and parts, when the broken parts can be made as good as new by welding. For example, a cost sheet from one mill using Standard Welding Apparatus covering a period of one year is as follows:

Department	Value of Parts if Purchased New	Total cost of welding, including supplies, labor, etc.	Actual saving Over New Parts
Weaving Room	$1,835.43	$364.33	$971.10
Card and Waste Room	305.35		
Spinning and Spooling Room	99.80		
Slashing Dept.	53.75	576.22	495.58
Cloth Room	45.15		
Machine Shop	502.50		
Miscellaneous	62.25		
TOTAL	$2,907.23	$1,440.55	$1,466.68

We not only supply the machine, and accessories, but we have an oxygen service second to none. Gas and supplies can be handled within a few hours after receipt of order. Shipments can be made promptly from Atlanta, Chattanooga or Savannah.

Our new oxygen plant in Atlanta, greatly increasing our output and facilities for service, will be in operation by June 1st.

We also have a corps of expert welders ready to come to your plant on a moment's notice to handle unusual breakdowns too big for your mechanics, or to teach your men how to use the apparatus.

A FEW OF THE MILLS USING STANDARD APPARATUS

Abbeville Cotton Mills, Abbeville, S. C.
Anchor Duck Mills, Rome, Ga.
Anderson Cotton Mills, Anderson, S. C.
Arlington Cotton Mills, Gastonia, N. C.
Avondale Mills, Birmingham, Ala.
Baldwin Cotton Mills, Chester, S. C.
Barrow County Cotton Mills, Winder, Ga.
Bibb Mfg. Co., Macon, Ga.
Bordon Mfg. Co., Goldsboro, N. C.
Brandon Mills, Greenville, S. C.
Brookford Mills, Hickory, N. C.
Cowpens Mfg. Co., Cowpens, S. C.
Cannon & Co., York, S. C.
Canton Cotton Mills, Canton, Ga.
Carolina Cotton and Woolen Mills, Spray, N. C., (seven mills.)
Cardinal Mills, West Point, Miss.
Carolina Bagging Co., Henderson, N. C.
Cherokee Falls Mfg. Co., Cherokee Falls, S. C.
Cherryville Mfg. Co., Cherryville, N. C.
Clayton Cotton Mills, Clayton, N. C.
Cleghorn Mills, Rutherfordton, N. C.
Cliffside Mills, Cliffside, N. C.
Clinton Cotton Mills, Clinton, S. C.
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Covington Cotton Mills, Covington, Ga.
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Fairfax Mills, Fairfax, Ala.
Florence Mills, Forest City, N. C.
Floyd Cotton Mills, Rome, Ga.
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Francis Cotton Mills, Bisco, N. C.
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Standard Gas Products Company

(INCORPORATED)

(Formerly Bird-Wilcox Co.)

Main Office
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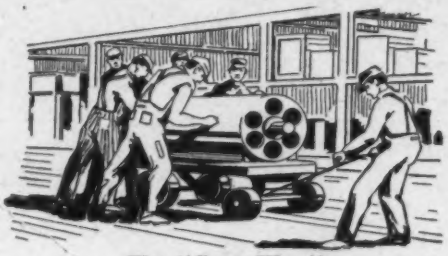
ECONOMY—

How did you get your start in the world? What universal law enabled you to build up a successful business? What practical principle underlies every successful achievement of man? It is ECONOMY!

No fortune can be accumulated without **economy of dollars** as a basis. No marked achievement in professional life can be made without **economy of minutes and personal energy.** No magnificent industrial institution can be developed and maintained without **economy of time, money, energy, space and materials.**



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Applied Economy is the Only Open Sesame to Opportunity

Masters of industry everywhere today are seeking eagerly new means of economical production. Thousands of them have already found it in

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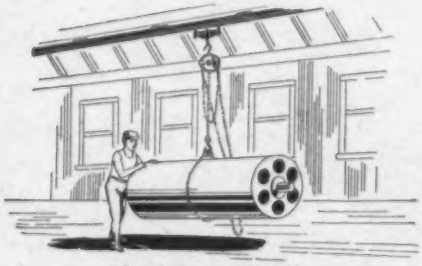

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CONVEYING EQUIPMENT

Suitable for lifting and conveying large or small loads of materials or products of any character and any weight up to four tons.

One man with an "OveR-Way" carrier can handle the same load which requires 5 to 16 men with trucks—and do it with greater ease and dispatch.

Would you be interested in our catalog of "OveR-Way" Conveying Equipment? If so, ask for Catalog GA-18.

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides"

CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA — AURORA, ILLINOIS, U.S.A. — BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO — LONDON, ONT.

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THE WALRAVEN COMPANY

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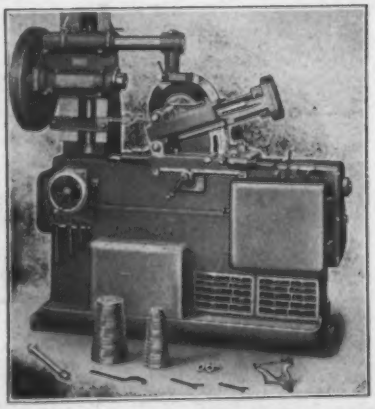

SINCE 1855 Brown & Sharpe have built Gear Cutting Machines. You will find them giving satisfactory service everywhere.

Whether it is for spur or bevel gears, large gears or small gears, there is a time-tried B & S Gear Cutting Machine to fill your need.

Brown & Sharpe machines are built up from foundry to inspection room with accuracy—accuracy for long service—the keynote of every operation.

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Our service is unexcelled

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Industry's Common Problem

POSITIVE, reliable temperature indication and control is a basic problem common to every industry. *Tycos* Indicating, Recording and Controlling Temperature Instruments have so successfully solved that problem that they have become standard in most of the world's industrial process work today.

Write us fully about your particular temperature problems—our long experience is at your command.

Taylor Instrument Companies

ROCHESTER N.Y.

There's a *Tycos* or *Taylor* Thermometer for Every Purpose

DD-1

Jenkins Standard Brass Gate Valves

Solid wedge, double-faced type. The wedge or gate is guided by ribs cast on the inside of body, which fit in corresponding grooves in the wedge, preventing the wedge from dragging across the seat. It is impossible to reverse the wedge because the rib on one side of the body is of different thickness from the opposite rib and each groove fits only its corresponding rib.

Suitable for 125 pounds working steam pressure or 175 pounds working water pressure. In additon to regular screwed and flanged patterns these valves are made in hose end, radiator and other styles.

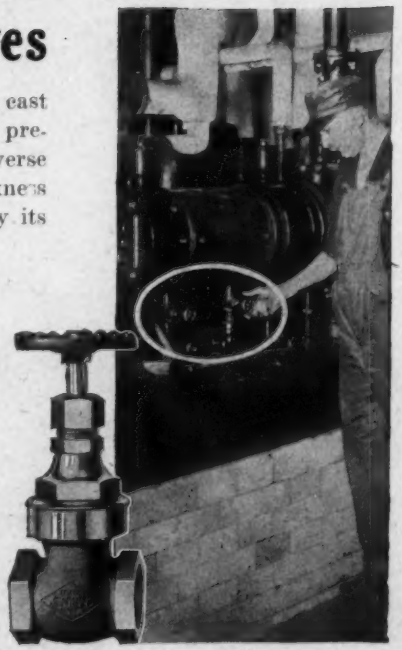

Fig. 370

Jenkins Brass Gate Valve, standard pattern stationary spindle, inside screw. Installation photograph taken in power plant of the Equitable Building, New York.

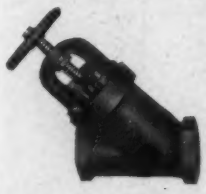

Fig. 296

Jenkins Y or Blow-off Valve. Iron body, standard pattern, composition mounted with renewable seat rings. Suitable for 150 pounds steam pressure or 250 pounds water pressure. Suitable for Boiler Blow-off Systems or handling heavy fluids.

Know genuine Jenkins Valves by the Jenkins "Diamond Mark" on the body—obtain them from supply houses everywhere.

JENKINS BROS.

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Jenkins Valves

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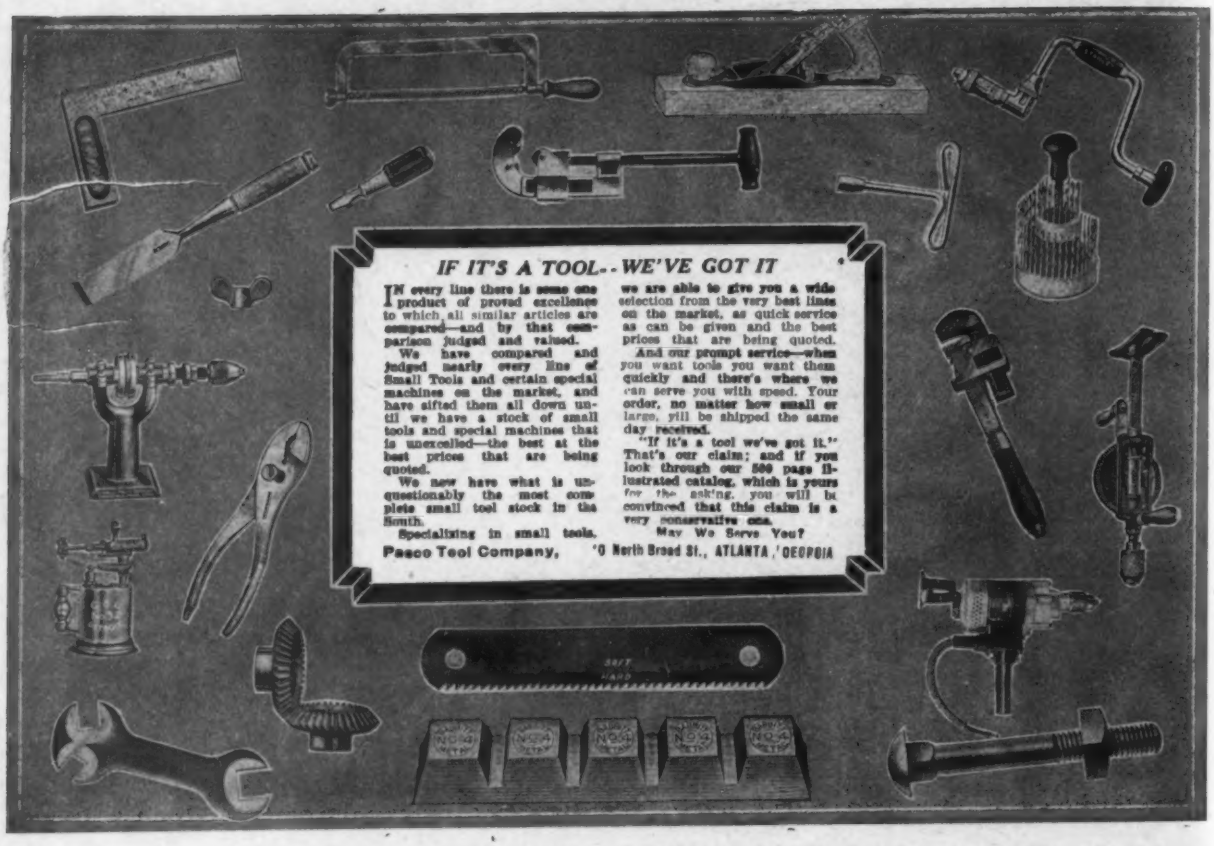
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IN every line there is some one product of proved excellence to which all similar articles are compared—and by that comparison judged and valued.
We have compared and judged nearly every line of Small Tools and certain special machines on the market, and have sifted them all down until we have a stock of small tools and special machines that is unexcelled—the best at the best prices that are being quoted.
We now have what is unquestionably the most complete small tool stock in the South.
Specializing in small tools.
Pasco Tool Company,
we are able to give you a wide selection from the very best lines on the market, as quick service as can be given and the best prices that are being quoted.
And our prompt service—when you want tools you want them quickly and there's where we can serve you with speed. Your order, no matter how small or large, will be shipped the same day received.
"If it's a tool we've got it." That's our claim; and if you look through our 500 page illustrated catalog, which is yours for the asking, you will be convinced that this claim is a very conservative one.
May We Serve You?
'0 North Broad St., ATLANTA, GEORGIA

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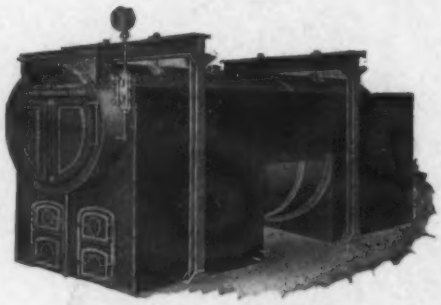
Set in Our Improved Steel Casings

SAVE 10% TO 25%

Of Your Fuel Bill.



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Structural Steel Work

Boiler Tubes, Castings, Etc.

The Walsh & Weidner Boiler Co.

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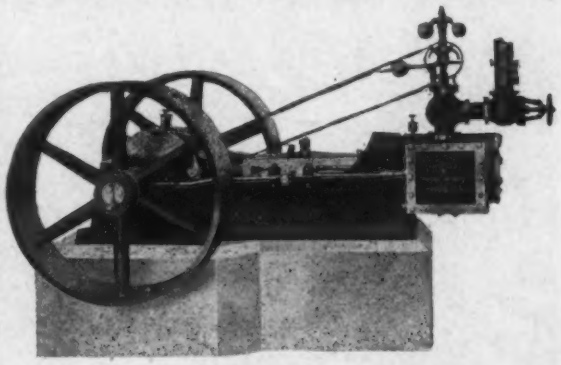

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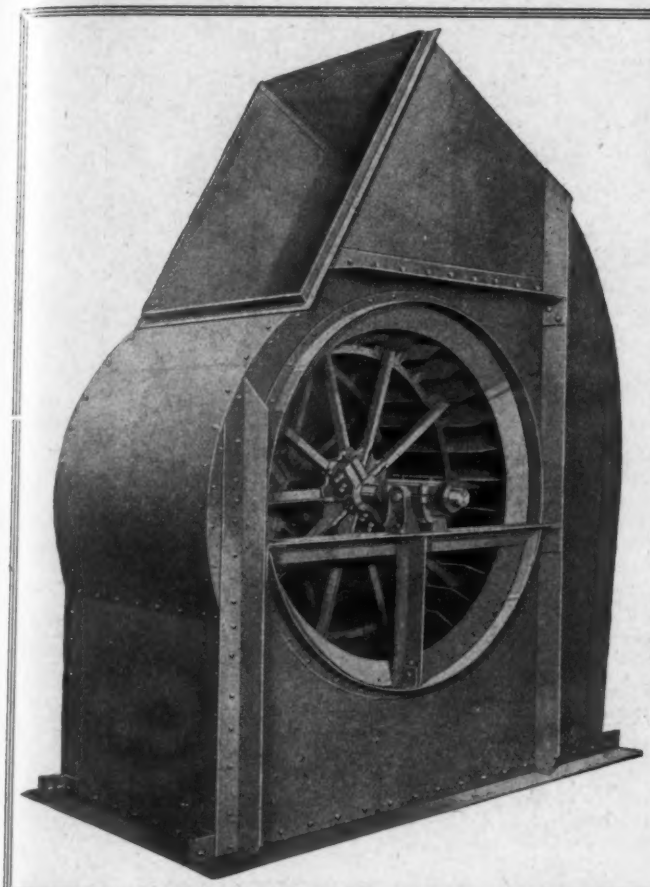
Heavy Castings and Wrought Iron Works.



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Seri-Vane Fans and Air Washers

We can always furnish special fans to meet unusual conditions.

Write for our latest fan catalog Number 70. You will find it worth while.

Estimates given promptly without any obligation.

Cut shows SERI-VANE FAN with special top angular discharge.

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Everything for the
Up-to-Date Machine Shop.

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MOTORS RENTED TELEPHONE YOUR WANTS
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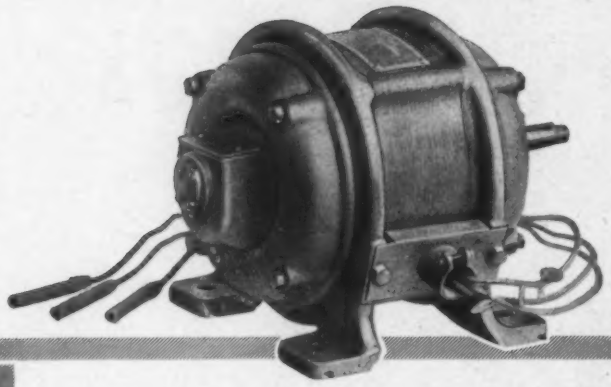

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**Totally Enclosed—Waste Packed Bearings—
Arranged for Conduit Connections—
High Efficiency.**

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Quick Action

Modern business demands it. Time is the most valuable asset of the executive.

**STROMBERG-CARLSON
INTER-COMMUNICATING SYSTEMS**

add hours to the business day—eliminate loss of precious minutes—save endless unnecessary footsteps.

They are easily installed—require no switchboard or operator. Their operation is simplicity itself.

Push *ONE* Button *ONCE*—and Talk.

Dixie Electric Equipment Co.

INDUSTRIAL ELECTRICAL EQUIPMENT

**Interior Telephones—Fire Alarm Apparatus.
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A Southern Concern—Giving Service to the South.
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4-in-1 Multiple Fuse

After a burnout, all you do is to give the ferrule a quarter turn, and a new fuse element is in circuit—all you need is your hands. When all four elements are used, your dealer or jobber replaces the shell with a new four-element fuse, at the lowest cost of any fuse in the market. In a word, you buy an Atlas fuse once; after that it is up to us.

Approved by both the Underwriters and Factory Mutual Laboratories in the various capacities as shown by their published listings. Orders accepted subject to approval in all sizes—250 to 600 volts.

Send for samples, prices and comparative statement showing costs of all makes of fuses based on authentic laboratory tests. Give name of your electrical dealer or distributor.

Multiple Electric Products Co.

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renewable
FUSES

—were the first line using an inexpensive bare link for restoring a blown fuse to its original efficiency to be Approved *In All Capacities*—0 to 600 amperes in both 250 and 600 volts—by the Underwriters' Laboratories.

—bear the "Und. Lab. Inspected" label. Economy "Drop Out" Renewal Links are stamped with the "Inspected" symbol.

—long ago won public approval—evidenced by the fact that for many years millions of them have been giving dependable protection, high efficiency and working marked economies.

—cut annual operating costs 80% as compared with the use of one-time fuses.

—are used wherever efficiency and economy are chief considerations—in steel mills, manufacturing plants of all kinds, buildings, and in every branch of industry.

—are used wherever safety is the prime consideration—in powder mills, hospitals, schools and the United States Navy.

—are absolutely accurately rated, made of the best materials and by the most skilled and careful workmen obtainable.

—are sold by all leading electrical jobbers and dealers.

Insist on getting Economy renewable Fuses.

Economy Fuse & Mfg. Co.

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NOON SUNLIGHT UNIT
No. 853

This unit introduces the principle of daylight illumination into the latest type of standard dome reflector. It should be used where daylight is required throughout the entire room or area. The enclosing globe is blue Trutint glass, which emits a light corresponding in color quality to that of sunlight at noon on a clear day. This unit is one of several adapted to the same service.

NELA TRUTINT

The original units for producing Artificial Daylight

NO matter whether your problem is matching colors, finding broken ends, preventing poor weaving, reducing seconds, or inspecting, you will find that better work is possible with Nela Trutint.

They are the original units for producing scientifically accurate artificial daylight.

Over 15,000 Nela Trutint units are now installed in all lines of commercial and industrial establishments, each of them giving complete satisfaction and proving their reputation for *accuracy*, *quality* and *service*.

Write for folder—"Daylight by Trutint." It shows the complete line of Trutint Units.

NELA SPECIALTIES DIVISION

National Lamp Works of General Electric Co.
NELA PARK, CLEVELAND, OHIO

NORTH SKYLIGHT UNIT
No. 798

NORTH SKYLIGHT UNIT
No. 734

These units should be used for localized lighting where the utmost precision in color matching, grading, and inspection is required. They are equipped with an accurate color filter in the form of a blue glass plate.

NORTH SKYLIGHT UNIT
No. 900

In the textile industry the portability of this unit is a distinct advantage. The stand is mounted on ball casters, and the light may be moved to any position by means of the self-adjusting friction joints.

HUNTINGTON & GUERRY

INCORPORATED

SUPERIOR ELECTRICAL INSTALLATIONS

FOR

TEXTILE MILLS AND VILLAGES

GREENVILLE **SOUTH CAROLINA**

Speed in Service is Only Rivaled by Accuracy
Each Would Be Useless Without the Other

Unfailing Service

In the struggle and stress of modern business life every moment of delay represents a loss of time and money which cannot be regained.

When promptness, accuracy and dispatch are the vital elements in the delivery of electric equipment or supplies it is natural to turn to the Carter Electric Company for service.

This is an organization whose members are trained to meet the demands of any emergency and this organization is ready to serve you on an instant's notice.

If your requirements cover Rubber Conduit Wire, Switches, Safety Switches, Wiring Devices, Fuses, Lamps or other electric supplies, it is only a matter of a few hours before we can place them in your hands.

This is because our warehouses are always fully stocked—everything you may need and in large quantities—and with every modern facility for handling your business the Carter Electric Company pledges you **Unfailing Service.**

Carter Electric Company

63 Peachtree Street, Atlanta

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BIRMINGHAM—1702 American Trust Bldg., Phone Main 1024
CHATTANOOGA—822 Hamilton Nat. Bk. Bldg., Phone Main 1559.

OUR SPECIALTIES

Income Tax Matters—Cost Accounting—Cotton Mills —Municipal and County Audits—Systematizing.

WELDING & REPAIRS

SOUTHERN WELDING & MACHINE CO.
192 COURTLAND STREET ATLANTA, GA

Gear Cutting and Machine Work.
No job too large or too small for us.
We specialize in cotton mill and oil mill welding and machine work.
Oxy-Acetylene and Electric Welding

SUPPLIES, MISC.

STENCILS — METAL CHECKS — RUBBER STAMPS

Send for Catalogue

Stencil Work for Cotton Mills Our Specialty

SOUTHERN STAMP & STENCIL CO.

7 W. Mitchell St. ATLANTA GA.

Dairy Supplies & Equipment
Leading Dairy Supply House of the South
(Established 1895)
Write Dept. E for new catalog and free "Dairy Head Book."
"PROMPT SERVICE" IS OUR MOTTO
Dairy & Farm Supply Co.
Atlanta, Ga.

COTTON, WASTE, LINTERS, Etc

International Cotton Products Company
15th floor Hurt Bldg., ATLANTA, GA.

Branches: Philadelphia, Pa. Charlotte, N. C.
Warehouses: Roseland, Ga.

COTTON COTTON WASTE LINTERS

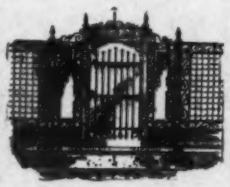
E. A. CUTTS C. S. CUTTS, SR.

E. A. CUTTS COMPANY
Cable Address: "CUTTS"
COTTON BROKERS
30 Bay Street, East
Savannah, Ga.
Office Phones—478—2713—Postal Phone
Long Distance—9929
Branch Office: E. A. CUTTS & SON, Augusta, Ga.

CONSTRUCTION

Cast Iron Columns
FOR
COTTON MILL CONSTRUCTION

American Cast Iron Pipe Company
COLUMN DEPARTMENT BIRMINGHAM, ALA



WIRE RAILINGS
WINDOW GUARDS
WIRE CLOTH
Established 1835.
DUFUR & CO.
309 N. Howard St., Baltimore, Md.

PLUMBING and HEATING
POWER & HAND PUMPS DAIRY SUPPLIES
PROMPT SERVICE.
HACKNEY BROTHERS CO.
No. 6 West 5th St., Charlotte, N. C.

Advertising conserves the Manufacturer's time by acquainting him with a service or product at his leisure long before the need for such arises.

Commission Merchants, Yarn Dealers, Cotton Dealers, and Brokers, Etc.

H. Ray Paige, Pres. J. A. Mandeville, Vice-Pres. J. H. Schoolfield, Secy. and Treas.

Southern Cotton Yarn Co., Inc.

1 Madison Avenue, New York City

SELLING AGENTS FOR

SOUTHERN MILLS

Carded—Combed Yarns

4's TO 120's SINGLE AND PLY

Selling Direct to Consumer.
NEW ACCOUNTS SOLICITED.

Weimar Bros.

Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.

MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER EDGAR H. BRIGHT
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MEMBERS OF
New Orleans Cotton Exchange
New Orleans Future Brokers Association
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New York Produce Exchange
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IMPORTER AND COMMISSION MERCHANT

LINEN YARNS

For Weaving, Knitting and all Purposes

TURKEY RED YARNS

For Towel Borders, Towellings and Bleaching Cloth

Linen Jacquard Harness Twine

And Every Description of Linen Thread and Twine

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DRY GOODS

Commission Merchants

43-45 WORTH STREET, NEW YORK

Hunter Manufacturing & Com. Co.

58-60 Worth St.,

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WORLD-WIDE DISTRIBUTOR OF COTTON FABRICS

COTTON FABRICS FOR HOME AND EXPORT

DOMESTIC BRANCH OFFICES

Boston **Chicago** **San Francisco**
Philadelphia **St. Louis** **Los Angeles**
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FOREIGN BRANCH OFFICES

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Santiago, Chile
San Juan, Porto Rico **Havana, Cuba** **Barranquilla, Columbia**

WOODWARD, BALDWIN & CO.

43 and 45 Worth Street, NEW YORK

Selling Agents for

SOUTHERN COTTON MILLS

Manufacturing Well Known Brands of

SHEETINGS
DRILLS
DIAPER CLOTH

SHIRTINGS
DUCKS
TOWELS

For Home and Export

ALL WEIGHTS AND CONSTRUCTIONS OF PRINT CLOTHS AND FINE CLOTHS IN PLAIN AND FANCY WEAVES

OUTING FLANNEL AND ROMPER CLOTHS
TOWELS AND DIAPER CLOTHS

Baltimore
St. Louis
St. Joseph

Philadelphia
San Francisco

Boston
Chicago
Shanghai, China

1866 **1920**

THE PUTNAM-HOOKER COMPANY

87 and 89 Leonard Street
NEW YORK CITY

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CINCINNATI CHICAGO ST. LOUIS

SELLING AGENTS SOUTHERN COTTON GOODS

J. H. LANE & CO.

INCORPORATED

NEW YORK

Selling Agents for
Cotton Mill Products

BOSTON CHICAGO

J. SPENCER TURNER CO.

56 WORTH STREET, NEW YORK

COTTON DUCK

ARMY—SAIL—WIDE

"LOWELL" TIRE FABRICS-SPECIAL DUCK

CRASHES—TWILLS—DRILLS—SATTEENS

ROPE—TWINE

COTTON YARNS

ESPECIAL ATTENTION GIVEN TO EXPORT REQUIREMENTS

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208 So. LaSalle Street

PHILADELPHIA
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161 Devonshire Street

HAMILTON, CANADA
J. Spencer Turner of Canada, Limited

Tolar, Hart & Holt Mills

Fayetteville, N. C.

Hosiery Yarns 20s to 30s on cones

TOLAR & HART

New York and Philadelphia

Selling Agents

WEIMAR BROTHERS

MANUFACTURERS OF

TAPES, BINDINGS AND NARROW FABRICS

2046-48 Amber Street,

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WILLIAM L. BARRELL CO.

BOSTON
NEW YORK

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CHICAGO
SAN FRANCISCO

COTTON DUCK

WIDE
SAIL
ARMY

SINGLE FILLING
DOUBLE FILLING
ENAMELING

Amoskeag Manufacturing Co.

34 Thomas Street, New York

27" and 32" GINGHAMS:—A F C, Utility, Three Star, Seersuckers, Staple, Bookfold Chambray, Maybourne Madras.

32" CHAMBRAYS:—19000 Range, Maybourne Madras, Invincible Suiting, Romper Cloth.

NARROW FLANNELS, FANCY:—1921, Smyrna, PLAIN:—Daisy Fleecedown, Iris, Tunis, 1921, Panola, Trinada, Ponceta, Tacuna, Pamela.

32" SHIRTING FLANNELS:—2701, 2801.

36" FLANNELS, FANCY:—1701, 1501, 1301, 1101, PLAIN:—Daisy, Fleecedown, Domet, 1501, 1101, 901.

TICKINGS, DENIMS, OLIVE DRAB TWILL, BLEACHED GOODS, GREY GOODS, SEAMLESS BAGS, TOWELING.

WORSTED GOODS:—Serges, Vigereaux, Poplins, Panamas.

Cooper & Griffin

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BRANCH OFFICE: ANDERSON, S. C.

CORRESPONDENTS:

Stephen M. Weld & Co.
New York, and Boston.

Weld & Neville
Houston, Texas, and New York.

Weld & White
New Orleans, La.

Weld & Co.
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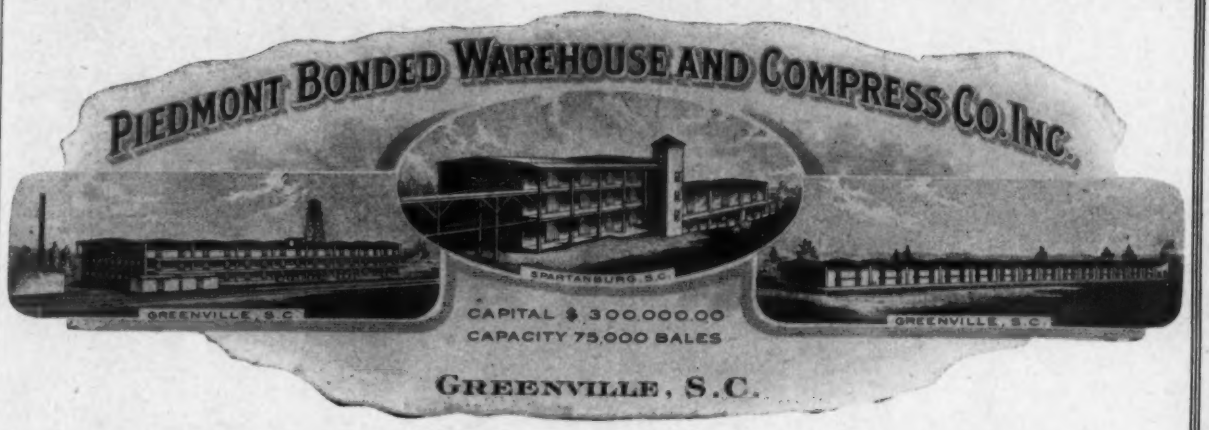


GREENVILLE, S.C.

OVER 500,000 bales of cotton are consumed annually within a radius of 50 miles of this Warehouse.
Situated in the midst of the great Cotton Manufacturing district of the Carolinas.
Facilities for distributing Mill Cotton are unsurpassed.
Have re-shipping privileges, without additional cost, from all points throughout the Cotton States, South and West of Atlanta, Georgia.
Its receipts are well and favorably known to all Southern, Eastern and Western Banks.
Warehouses are protected with Sprinkler System, which guarantees best insurance rates.
Our rates for services rendered patrons are reasonable.
For further information, apply to

C. T. TURNER, Manager, Greenville, S. C.

Financing the Textile Industry

AN adequate and steady flow of banking capital is a vital necessity for mill owners, selling agents, and other interests in the textile industry.

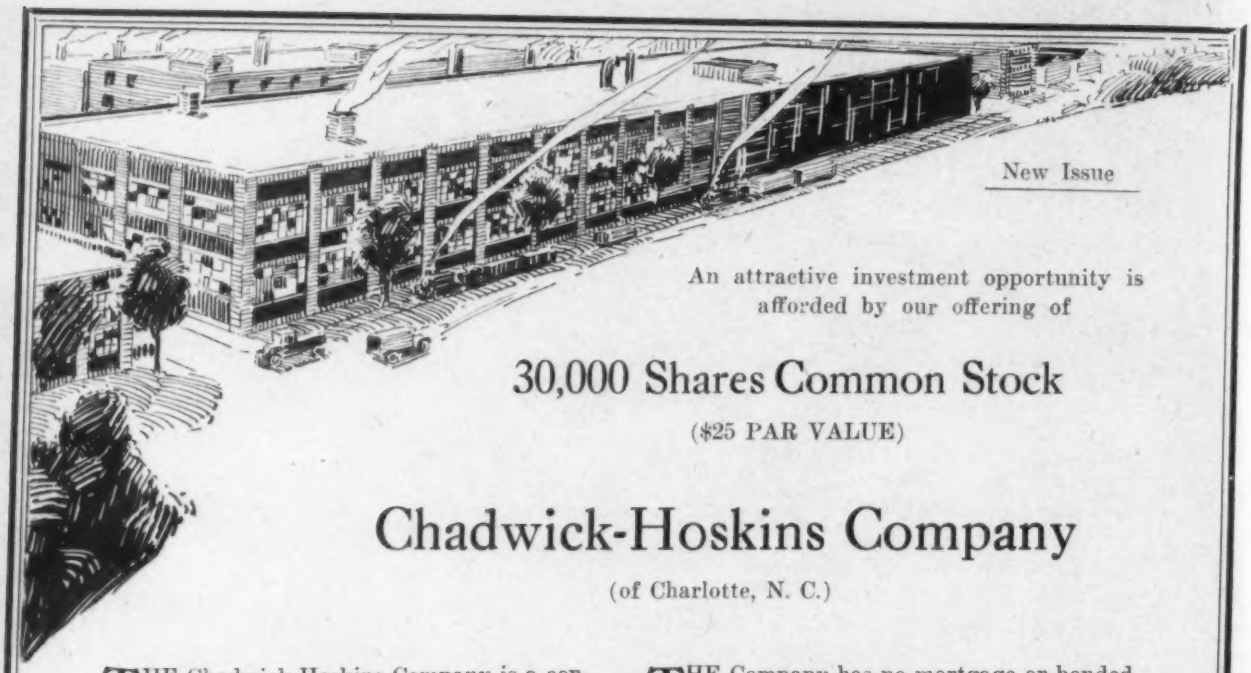
Through a factoring arrangement with this Company, such interests are enabled to finance their current operations; but in addition to the usual facilities supplied by factors, the Company is also empowered to finance raw material requirements, and to provide for such growth as the rising volume of business demands.

We shall have pleasure in discussing with manufacturers, selling agents, and others any concrete problems which have to do with the financing of their business.

TEXTILE BANKING COMPANY
(Incorporated)
50 Union Square New York
(4th Avenue and 17th Street)

Capital $2,000,000 *Surplus $500,000*

Inaugurated by GUARANTY TRUST COMPANY OF NEW YORK
and LIBERTY NATIONAL BANK OF NEW YORK



New Issue

An attractive investment opportunity is afforded by our offering of

30,000 Shares Common Stock

($25 PAR VALUE)

Chadwick-Hoskins Company

(of Charlotte, N. C.)

THE Chadwick-Hoskins Company is a consolidation of six big cotton mills, forming one of the largest cotton manufacturing concerns in the Southern States.

THE Company has no mortgage or bonded indebtedness. Authority has been given to the directors to retire the outstanding Preferred Stock in November, 1920.

CAPITALIZATION

7% Cumulative Preferred Stock ($100 Par Value) $800,000
Common Stock ($25 Par Value) 200,000 Shares

DURING the four years ended December 31, 1919, the consolidated earnings of the six properties, after Federal taxes, averaged $521,718 per year. For the three months ended March 31, 1920, the combined earnings, before Federal taxes were $560,565. Provisions are being made to operate two of the mills day and night. This should mean a substantial increase in output and earnings.

THE present consolidation was on a basis of $40 per spindle, which is less than the actual appraisal of the properties. With the retirement of the Preferred Stock, spindleage on the consolidated properties will be reduced to $32.80. On the basis of present earnings and the retirement of the Preferred Stock, we believe an annual dividend of $2.50 per share will be paid.

We offer this Common Stock for subscription subject to allotment, when, as and if received by us at

$28 Per Share

SERVICE SECURITY

SECURITIES SALES CO.

NEW YORK
NEW ORLEANS
MEMPHIS

CHARLOTTE
BIRMINGHAM
JACKSONVILLE

64 PEACHTREE STREET, ATLANTA, GA.

(The above information, though not guaranteed, is obtained from reliable sources and we have depended on it in purchasing this stock)

1865—The Oldest National Bank in the Cotton States—1920

THE ATLANTA NATIONAL BANK

and

Altanta's Progress—No. 10

Atlanta's quarter-century growth as a publication center tells another interesting story of her civic progress.

25 Years Ago—

Atlanta had only 15 newspaper and periodical publications, with a total circulation, per issue, of..... 289,000

Today—

There are 58 newspapers, magazines and other periodicals published in Atlanta, with an aggregate circulation per issue of..... 1,182,240

United States Postoffice receipts from these publications, annually, are between $250,000 and $300.000.

Alert and wide awake to Atlanta's every interest, and bigger and better than ever, Atlanta's newspapers and other publications never lose opportunity to advance the community interests. They have contributed a wonderful share to Atlanta's marvelous growth.

The Atlanta National Bank, like them—of and for Atlanta—seeks and uses every opportunity for CONSTRUCTIVE CITY BUILDING; and

Because it has made that its policy and followed it through 54 years of SERVICE to individual and to community, it has reached the pinnacle represented in these interesting figures:

Deposits over $27,000,000.00
Resources over $37,000,000.00

In the Heart of Atlanta —the Heart of the South

That's the story of ATLANTA NATIONAL SERVICE. Make it your SERVICE for more and better business.

THE ATLANTA NATIONAL BANK

Capital, Surplus and Profits, $2,500,000.00

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LEO STILLMAN

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"---because you always give us an interested service---more than just routine banking"

This was the reason a prominent manufacturer recently gave for concentrating his business with the Citizens & Southern Bank.

This "interested" service has resulted from the sharply defined policy of treating each customer's business as individual and of endeavoring to keep all our officers acquainted with all our customers and their requirements.

Capital and Surplus $4,500,000

The Citizens & Southern Bank

Atlanta—Marietta at Broad

Savannah Macon Augusta

"No account too large, none too small"

THE AMERICAN AUDIT COMPANY

100 BROADWAY, NEW YORK CITY

F. W. LAFRENTZ, C. P. A., President.

H. M. RICE, C. P. A., Vice Pres. A. F. LAFRENTZ, Secy. & Treas.

BRANCHES:

New York	Chicago	Atlanta	Boston
Richmond	Baltimore	New Orleans	Philadelphia
Washington, D. C.	Milwaukee	Scranton	London, E. C.

Our Reports of Audit and Our Certificates of Condition and Operations, Are Known and Have Weight in the Financial Centers of the World

ATLANTA BRANCH

1013 Fourth National Bank Building, Atlanta, Ga.

C. B. BIDWELL, C. P. A., Resident Vice President.

Classified Opportunities.

Positions Wanted

WANTED—Position as superintendent in a small mill or overseer of carding in a large mill. Have had seven years experience as overseer of carding in large mills; also experience in spinning and weaving. Textile graduate, 1909. Can handle almost any position in a mill. Can furnish first class references as to character and ability. Address Box 17, care COTTON, Atlanta, Ga.

For Sale

FOR SALE

One 1500 spindle yarn mill in operating condition.

ATLANTA COTTON MILLS CO.

Atlanta, Ga.

FOR SALE

Eight 24 Roller Double Acting Borcher Nappers 86" wide. Two 20 Roller Double Acting Woonsocket Nappers 80" wide. Four 20 Roller Double Acting Woonsocket Nappers 86" wide. All in good condition. Price $1,000 each.

PASSAIC PRINT WORKS,
Passaic, N. J.

RATES:

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(When replies are to be received in our care, allow four words for box address.)

DISPLAYED.

"For Sale" and all other advertisements using bold-face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

Have You?

Have you any proposition to put before the executives in the textile mills of the South? Anything to sell or buy that they may want or have? Do you want a better position or do you want a good man to fill a position?

Whatever your message, this "Classified Opportunities section of COTTON is the logical place for the announcement of your requirements.

It's the meeting place for Employer and Employee, and a good salesman in print for anything you want to dispose of.

A little ad. won't cost much. Try it for a month or so.

For Sale

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,
127-31 N. Third St.
Philadelphia, - Pennsylvania

Miscellaneous

S. S. STORER, M.E., C.E.
Complete plans for
Textile Mills, Commercial Buildings, Bridges.
Personal Attention, Fees Reasonable.
Atlanta, Ga.

SECOND-HAND MACHINERY FOR SALE

LAPPERS

1—40" 2 beater Kitson breaker with feeder.
1—40" 1 beater Saco Lowell finisher.
1—40" 2 beater Pollard & Johnson breaker with feeder.
2—40" 1 beater Atherton Finisher.
4—40" H & B Finishers.

CARDS

4—40" Hetherington.
12—37" H & B.
1—60" 3 cylinder garnett.
3—40" wool.
2—Kitson threaded extractors.
1—24" Kitson 1 cylinder Burr Picker.

DRAWINGS

2—Pettee, 6 deliveries each 10" coil, leather roll.
18—Whitin, 4 deliveries 12" coil, leather roll.
10—Whitin, 6 deliveries 12" coil, leather roll.

SLUBBERS

2—12x6 Saco water power, fall delivery.
3—11x5½ Saco water power, 60 spindles.
1—11x5½ Hetherington 48 spindles.
1—11x5½ Lowell 40 spindle.

INT. SPEEDERS

4—9x4½ Saco water power, 100 spindles each. Fall delivery.
6—9x4½ Saco Pettee, 84 spindles each.
1—9x4½ Lowell, 96 spindles each.

SPEEDERS

5—8x4 Providence, 104 spindles each. Summer delivery.
2—8x3½ Saco water power, 128 spindles each. (Fall).
2—8x4 Herthington, 120 spindles each.
2—8x4 Hetherington, 120 spindles each.

SPINNING

4—Lowell, 2¾ gauge 1¾ rings, 144 spindles each.
22—Whitin, 2¾ gauge 1¾ rings, 194 spindles each.

SPOOLERS

1—4x6 Whitin 100 spindle.
3—4x6 Lowell, 60 spindles each.
3—4x6 Lowell, 100 spindles each.

WINDERS

2—No. 6 Foster, 100 spindles each.
10—Lowell Cam'less, 16 spindles each.
6—No. 50 Universal.

WARPERS

4—Hopedale Section beam warper.
1—Entwistle Ball warper.
1—Lowell Section Beam Warper.
1—double head single linker.
1—double head double linker denn.
1—double Ball attachment for warper.

TWISTERS

4—192 spindle Hopedale, 3⅛" gauge, 2" rings, creel for 4 ply.
1—192 spindle F & J wet twisters, 2¾ gauge 1¾ rings.
1—220 H & B wet twisters, 3¼ gauge 2¼ ring.
3—200 spindle Draper twister 3½ gauge 2¼ rings.
1—Tod rope machine with double former.
1—Haskell & Dawes Rope Machine, 2 formers, 1 coiler, producing 1600 lbs. per day.

CLOTH ROOM MACHINERY

1—40" C & M Brusher.
1—40" C & M Calender.
1—40" Folder.
1—40" Lowell Folder.

LOOMS

42—40" Whitin equipped 5 to 16 harness.
150—34" A—Model Draper automatic.
150—32" E—Model Draper automatic.
74—40" plain Mason, practically new.
12—40" Crompton & Knowles, equipped for ginghams.
98—37½ Crompton & Knowles, 2 to 5 harness.

MISCELLANEOUS

1—new Hrom bobbin cleaner.
1—new 20-spindle Payne Winder.
10,000 filling bobbins, No. 2 Draper spindle.
10,000 4x6 twister bobbins, wood or metal head.
2500 filling twister bobbins for Draper twisters.
10,000 warp spinning bobbins.
5000—3 ring filling quills for No. 2 Draper spindle.
7000—2 ring filling quills for Whitin Gravity spindle.
117 ft.—38" 3 ply leather belt.
25 ft.—9" 2 ply leather belt.
75 ft.—8" 2 ply leather belt.
25 ft.—6" 2 ply leather belt.
500—10" Roving Cans.
1—36" Kitson Condenser with pipe and fan.
40—Gordon & Hay Card Attachment for H & B Cards.
3—Dazey Yarn Pressers, double screw.
1—Small hand post drill.
1—Hose extractor direct connected 30" copper basket.
1—48" broad bant extractor copper basket, steam driven.
1—William Firth Co. Card Stripper for 40" card.
3—No. 5 B. Suction Fans.
1—15" Sturtevant Fan.
1—No. 6 15" Sturtevant Fan.
2—New Whitin gear cutters.

Write or Wire ATLANTA TEXTILE MACHINERY CO., AUSTELL BLDG., ATLANTA, GA.

Buyers' Index

Acetylene Welding Apparatus.
(See Welding Apparatus.)

Acteylene Gas.
Commercial Acetylene Supply Co.
Lindo Air Products Co.
Oxweld Acetylene Co.
Prest-O-Lite Co.
Southern Welding Co.
Standard Gas Products Co.

Accountants.
(See Auditors and Accountants.)

Air Brakes.
Allis-Chalmers Mfg. Co.

Air Washers
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Air Conditioning Systems.
(See Humidifying Apparatus.)

Albona.
Roessler & Hasslacher Chemical Co.

Alkalies.
(See Dyestuffs and Chemicals.)

Aniline Colors.
(See Dyestuffs and Chemicals.)

Anti-Chlorine.
(See Dyestuffs and Chemicals.)

Aprons-Rub.
Ladew & Co., Inc., Edw. R.
Smith & Furbush Machine Co.
Graton & Knight Mfg. Co.

Architects and Engineers.
Aberthaw Construction Co.
Draper, E. S.
Ferguson Co., John W.
Lockwood, Greene & Co.
Sirrine, J. E.

Ash Handling Machinery.
Link-Belt Company.
Portable Machinery Co.

Asphalt Slate Shingles.
(See Slate Asphalt Roofing.)

Auditors and Accountants.
American Audit Co.
Lemon & Co., G. L.

Auto Trucks.
(See Trucks—Auto.)

Automatic Loom Attachments.
(See Loom Attachments.)

Automatic Scales.
American Kron Scale Co.

Ball Bearings.
Aldrich Mch. Works.
Hyatt Roller Bearing Co.
New Departure Mfg. Co
S K F Industries.
U. S. Ball Bearing Co.

Ball Bearing Spindles.
Allen Spindle Corp.

Ball Bearing Housings.
Aldrich Mch. Works.

Bale Band Buckles.
(See Box Strapping & Buckles.)

Bale Ties.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Baling Machines.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Gallard-Henning Mfg. Co.
Hulme, J. S.
Saco-Lowell Shops.
Southwark Fdry. & Machine Co.

Baling Presses.
Butterworth & Sons Co., H. W.
Economy Baler Co.
Gallard-Henning Mfg. Co.
Hulme, J. S.
Lovingood Co.
Philadelphia Drying Mchry. Co.
Smith & Furbush Mfg. Co.
Southwark Fdry. & Machine Co.

Bandages, Tapes, Etc.
American Textile Banding Co.

Banding Straps and Buckles.
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Banks.
Atlanta National Bank.
Citizen & Southern Bank.
Irving National Bank.
National Bank of Commerce in New York.
Textile Banking Co., Inc.

Bars (Corrugated for Concrete Reinforcement).
Corrugated Bar Co.

Barometers.
Taylor Instrument Co.

Barrels—Fibre.
(See Fibre Products.)

Baskets—Mill.
(See Boxes—Mill.)

Batteries (Elec.)
(See Storage Batteries).

Beam Dyeing Machines.
Cocker Mchry. & Foundry Co.

Beam Heads (Steel).
Mossberg Co., Frank

Beaming and Warping Mchry.
(See Warpers and Warping Machinery).

Bearings.
Diamond State Fibre Co.
Hyatt Roller Bearing Co.
New Departure Mfg. Co
Standard Pressed Steel Co.
S K F Industries.
U. S. Ball Bearing Co.
Valley Iron Works.

Belting.
American Supply Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
U. S. Rubber Co.
Walraven Co.
Williams & Co., I. B.

Belting—Chain Link.
Link-Belt Company.
Morse Chain Co.

Belting—Rope.
(See Rope Transmission.)

Belt Conveyors.
Link-Belt Company.
Morse Chain Co.
Portable Machinery Co.
Williams & Sons, I. B.

Belt Dressing.
Jos. Dixon Crucible Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Walraven Co.
Williams & Co., I. B.

Belt Fasteners.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co.

Belt Hooks.
Crescent Belt Fastener Co.

Belt Lacing.
Crescent Belt Fastener Co.
Flexible Steel Lacing Co
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc., Edw. R.
Stanley Belting Corp.
Walraven Co.
Williams & Sons, I. B.

Belt Rivets.
Crescent Belt Fastener Co.

Belt Tighteners.
Link-Belt Company.
Williams & Sons, I. B.

Benches (Park & Playground).
Hill-Standard Co.

Billiard Tables & Etc.
Brunswick-Balke-Collender Co.

Bleacheries.
(See Dyers, Bleachers and Finishers.)

Bleaching Kiers.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machinery Co., The

Bleaching Machinery.
(See Dyeing, Bleaching & Finishing Machinery).

Bleaching Materials.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Bosson & Lane.
Born, Scrymser Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Kilpstein & Co., A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Surpass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques

Blowers and Blower Systems.
American Blower Co.
Carrier Eng. Corp.
General Electric Co.
New York Blower Co.
Phila. Drying Machinery Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

Boards—Fibre.
Diamond State Fibre Co.

Boards—Form.
Pearson, Jos. T.

Bobbins.
Brown Co., The David
Draper Corporation.
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.
Shambow Shuttle Co.
Whitin Machine Works.

Bobbin Heads.
Diamond State Fibre Co.

Boilers.
Crymes Mchry. & Supply Co.
International Engineering Wks., Inc.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Co., J. S.
Toomey, Frank.
Walsh & Weidner Boiler Co.

Boiler Feed Water Purification.
Permutit Co.
Refinite Co.
Scaife & Sons, Wm. B.

Boiler Room Fittings & Supplies.
Crane Co.
International Engineering Co.
Jenkins Bros.
Lunkenheimer Co.

Boiler Graphite.
Jos. Dixon Crucible Co.

Box Strapping and Tie Buckles.
Acme Steel Goods Co.
Draper Corporation.
Lovingood Co.
Regnas & Co., J. R.
Signode System, Inc.

Boxes—Mill.
Diamond State Fibre Co.
Hightower Box & Tank Co.
Keystone Fibre Co.
Lane & Bros., W. T.
Rogers Fibre Co.
Standard Fibre Co.

Bowling Alleys, Etc.
Brunswick-Balke-Collender Co.

Braids.
(See Tapes.)

Brake Linings.
Diamond State Fibre Co.

Brazing.
(See Welding).

Brushes—Mill.
Felton Brush Co., D. D.
Felton, S. A. & Son Co.

Brushes—Commutator.
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

Buckets & Pails—Mill.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Buckets—Elevator and Grab.
Link-Belt Company.

Buckles—Cotton Tie.
(See Box Strapping and Ties).

Building Contractors.
(See Architects & Engineers.)

Buildings—Portable.
Lockwood, Greene & Co.
Aladdin Co.
Tuxbury Lumber Co., A. C.

Building Material.
Aladdin Co.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Barrett Co., The
Birmingham Slag Co.
Carlisle & Gale Co.
Corrugated Bar Co.
Detroit Steel Products Co.
Dufur & Co.
Excello Mfg. Co.
Hurst Co.
Lockwood, Greene & Co.
Nashville Hardwood Flooring Co.
Peaslee-Gaulbert Co., Inc.
Portland Cement Asso.
Tuxbury Lumber Co., A. C.

Bungalows (Quickly Built).
Aladdin Co.
Tuxbury Lumber Co., A. C.

Burr Pickers.
Sargent's, C. G., Sons.
Smith & Furbush Machine Co.

Bushings.
Diamond State Fibre Co.
Southern Spindle & Flyer Co.

Calenders.
Textile Finishing Mchy. Co.

Calender Rolls.
Roy & Son, B. S.

Calling System (Inter Telephone).
Carter Elec. Co.

Cans—Roving.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.

Cars and Trucks—Fibre.
(See Trucks.)

Car Unloaders.
Portable Machinery Co

Carbonizing Machines.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargents Sons & Co., C. G.
Textile Finishing Machinery Co., The

Carding Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Clothing.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Card Feeds.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.
Whitin Machine Co.

Card Grinding Machinery.
Roy & Son Co., B. S.
Smith & Furbush Mch. Co.
Whitin Machine Works.

Carpet Machinery.
Butterworth, H. W., & Sons Co.
Crompton & Knowles Loom Wks.
Proctor & Schwartz, Inc.
Schofield, Wm. Co.
Smith & Furbush Mch. Co.
Textile Finishing Mchy. Co., The

Carrier Aprons.
(See Aprons.)

Casement Window Hardware.
Richards-Wilcox Mfg. Co.

Castings.
American Cast Iron Pipe Co.
Lombard Foundry & Mch. Co.
McNaughton Mfg. Co.
Valley Iron Works.
Walsh & Weidner Boiler Co.

Cast Iron Columns.
American Cast Iron Pipe Co.

Caustic Soda.
(See Bleaching Materials.)

Cement Machinery.
Allis-Chalmers Mfg. Co.

Cement Reinforcement.
Corrugated Bar Co.

Cement and Brick Coating.
Dixon Crucible Co., Jos.
Hurst Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth Howland & Co., Inc.

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(See Belting—Chain Link.)

Chain (Block, Bicycle, Auto Engine, Agricultural, Etc.)
Morse Chain Co.

Chairs and Stools
Wright Co.
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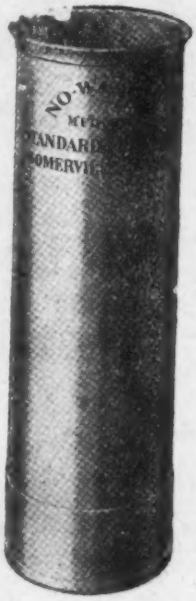

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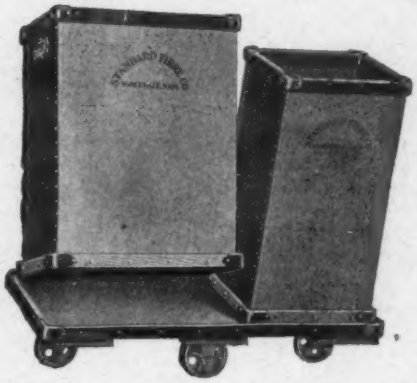
CANS

BOXES

DOFFING
TRUCKS



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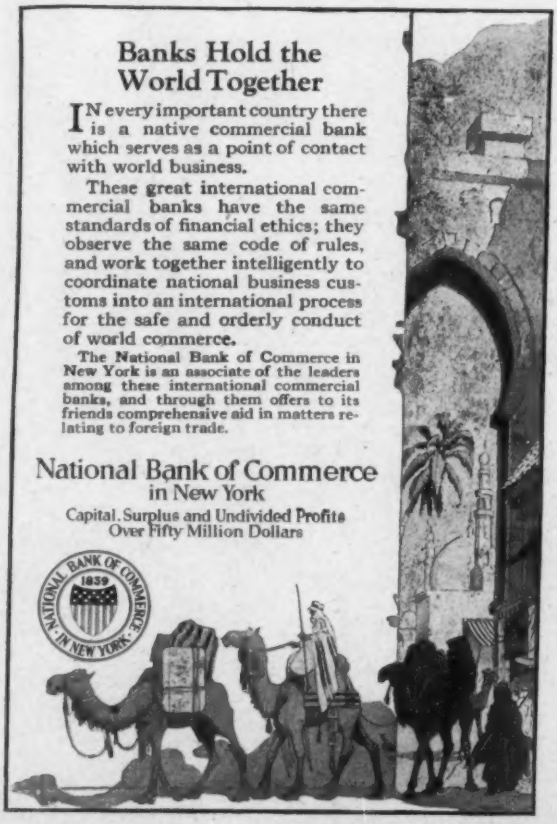

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Management
JOHN L. HORGAN

BUYERS' INDEX—Continued.

Checks—Metal.
(See Stamps, Stencils, etc.)
Chemicals.
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Chlorine Gas.
Electro Bleaching Gas Co.
Clocks (Hank, Etc)
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Clocks (Time).
Eco Clock Co.
International Time Recorder Co.
Clocks (Watchman).
Eco Clock Co.
Chicago Watchman Clock Wks.
Closets (Water).
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Cloth Balers.
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Cloth Cutters.
Cameron Machine Co.
Firsching, J. A.
Wildman Mfg. Co.
Cloth Room Machinery.
Butterworth, H. W. & Sons Co.
Cameron Machine Co.
Firsching, J. A.
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Scott & Co., Henry L.
Textile Finishing Machinery Co.
Wildman Mfg. Co.
Cloth Shrinking Machinery.
Reliance Machine Works.
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Clutches (Friction.)
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Clutch Linings.
Diamond State Fibre Co.
Coal Driers (Centrifugal).
Link-Belt Company.
Coal Handling Machinery.
Link-Belt Company.
Portable Machinery Co.
Coal Tar Disinfectants.
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Cocks.
Lunkenheimer Co.
Color Pails.
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Comb Aprons.
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Commission Merchants and Dealers.
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Compresses (Cotton).
Bridge & Co., Ltd., David
Southwark Fdry. & Machine Co.
Compression (High Density).
Bridge & Co., Ltd., David
Southwark Fdry. & Machine Co.
Compressors, Air.
Allis-Chalmers Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
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Seeger Machine Tool Co.
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Concrete Reinforcement.
Corrugated Bar Co.
Condensers.
Allis-Chalmers Mfg. Co.
Seeger Machine Tool Co.
Conduits.
Diamond State Fibre Co.
Connectors (Frankel Solderless)..
Westinghouse Elec. & Mfg. Co.
Contractors (Building).
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Contractors (Electrical).
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Controlling Instruments (Temperature).
Powers Regulator Co.
Pagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Conveyors (Belt).
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Conveying Machinery.
American Supply Co.
Collins, J. D.
Cresson-Morris Co.
Hulme, J. S.
Link-Belt Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Portable Machinery Co.
Richards-Wilcox Mfg. Co.
Saco-Lowell Shops.
Seeger Machine Tool Co.
Schofield, Wm. Co.
Walraven Co.
Smith & Furbush Machine Co.
Valley Iron Works.
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Coolers.
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Saco-Lowell Shops.
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The.
Corrugated Bars.
Corrugated Bar Co.
Cotton Yarn and Cloth Commission Merchants and Dealers.
Amoskeag Mfg. Co.
Barrell Co., Wm. L.
Carver-Beaver Yarn Co., Inc.
D'Olier & Co., Franklin
Fawcett, Hughes.
Florshein, H. A.
Hunter Mfg. & Comm. Co.
Lane, J. H. & Co.
Putman-Hooker Co.
Tolar & Hart.
Turner Co., J. Spencer.
Southern Cotton Yarn Co.
Weimar Bros.
Woodward Baldwin & Co.
Cotton Dealers and Brokers.
Beer, H. & B.
Cooper & Griffin, Inc.
Cutts, E. A.
Dixie Cotton Waste Co.
International Cotton Prod. Co.
Webb, Inc., C. S.
Cotton Mill Machinery and Supplies.
Barber-Colman Co.
Brown Co., David.
Butterworth & Sons, H. W.
Cameron Machine Co.
Cocker Mch. & Foundry Co.
Crymes Mchry. & Supply Co.
Crompton & Knowles Loom Wks.
Draper Corporation.
Firsching, J. A.
Fletcher Works.
Foster Machine Co.
Greenville Spool & Mfg. Co.
Hopedale Mfg. Co.
Howard & Bullough.
Jones Mchry. Corp.
Mason Machine Works.
Mill Supply Co. of Greenville.
Phila. Drying Mchy. Co.
Proctor & Schwartz, Inc.
Sargent's Sons, Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shawmut Eng'g Corp.
Smith & Furbush Mach. Co.
Stafford Co.
Steel Heddle Mfg. Co.
Terrell Machine Co.
Textile Finishing Machinery Co.
Universal Winding Co.
Whitin Machine Works.
Whittinsville Spinning Ring Co.
Cotton Tape Loom.
Fletcher Works.
Schaum & Uhlinger.
Cotton Yarn Mills.
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Counters (Revolution, Hank, Pick, Etc).
Veeder Mfg. Co.
Covers (Roller).
Diamond State Fibre Co.
Cranes (Locomotive).
Link-Belt Company.
Crayons.
Dixon Crucible Co., Jos.
Lovingood Co.
Lowell Crayon Co.
Regnas & Co., J. R.
Creosote Oil.
Gulf States Creosoting Co.
Crushing Machinery.
Allis-Chalmers Mfg. Co.
Cutters (Cloth).
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Cutters (Thread)
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Dairy Supplies.
Dairy & Farm Supply Co.
Hackney Bros. Co.
Dehumidifying.
Sturtevant Co., B. F.
Delivery Cases.
Diamond State Fibre Co.
Dial Scales.
American Kron Scale Co.
Dies (Steel).
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Discs (Fibre).
Diamond State Fibre Co.
Disinfectants.
Barrett Co., The
Frederick Disinfectant Co.
Dobby Chains.
Crompton & Knowles Loom Wks.
Whitin Machine Works.
Doffing Boxes (Mill).
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Doffing Cars.
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Door Closers and Checks.
Richards-Wilcox Mfg. Co.
Door Hangers.
Richards-Wilcox Mfg. Co.
Door Mats (Steel).
Acme Steel Goods Co.
Lovingood Co.
Regnas & Co., J. R.
Draft Gauges and Thermometers.
Taylor Instrument Co.
Drawing Frames.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.
Drills (Electric).
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Drinking Fountains.
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Drop Wires.
Steel Heddle Mfg. Co.
Drying Apparatus.
New York Blower Co.
Sturtevant Co., B. F.
Drying Forms (Hosiery).
Pearson, Jos. T.
Drying Machinery.
American Laundry Mchry. Co.
Butterworth, H. W. & Sons Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The
Dust Collectors.
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Dusting Machinery.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Dyers, Bleachers and Finishers.
American Processing Co.
Dyeing, Bleaching, Finishing and Printing Machinery.
American Laundry Mchry. Co.
Atlas Electric Devices Co.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Permutit Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Refinite Co.
Reliance Machine Works.
Rome Mch. & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The
Tolhurst Machine Works.
Dye Sticks.
Phila. Drying Machinery Co.
Dyestuffs and Chemicals.
Althouse Chemical Co.
American Dyewood Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Barrett Co.
Borne, Scrymser Co.
Bosson & Lane.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electro Bleaching Gas Co.
Grasselli Chemical Co.
Hemingway Inc., Frank
Kali Mfg. Co.
Klipstein & Co., A.
Lewis, John D.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Newport Chemical Works, Inc.
Roessler & Hasslacher Chemical Co.
Sunbass Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques
Ejectors.
Sherwood Mfg. Co.
Electric Dynamos and Motors.
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Electric Fans.
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Electric Lamps.
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Electric Lamp Guards.
Flexible Steel Lacing Co.
Electrical Engineers and Contractors.
Dixie Electrical Equipment Co.
Huntington & Guerry, Inc.
Imperial Electric Co.
Electrical Machinery and Supplies.
Adams-Bagnall Electric Co.
Allis-Chalmers Mfg. Co.
Atlas Electric Devices Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
Crymes Mchry. & Supply Co.
Dixie Electrical Equipment Co.
Economy Fuse & Mfg. Co.
General Electric Co.
Jones Mchry. Corp.
Multiple Electric Products Co.
Nela Specialties Division
Phila. Electric Co.
Seeger Machine Tool Co.
Walraven Co., The
Walsh & Weidner Boiler Co.
Westinghouse Electric & Mfg. Co.
Electrical Repairing (all kinds).
Bryan Electric Co.
Dixie Electrical Equipment Co.
Electric Tractors and Trucks.
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Elevators.
Collins, J. D.
Link-Belt Company.
Seeger Machine Tool Co.
Enamel—Mill White.
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Engineers (Mill).
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Engines—Oil, Gas and Gasoline.
Crymes Mchry. & Supply Co.
Seeger Machine Tool Co.
Engines—Steam.
Allis-Chalmers Mfg. Co.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Lombard Iron Works & Supply Co.
Schofield's Sons Co., J. S.
Toomey, Frank
Walsh & Weidner Boiler Co.
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Jenkins Bros.
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Sherwood Mfg. Co.
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Crane Co.
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International Eng. Wks.
Jenkins Bros.
Jones Mchry. Corp.
Lunkenheimer Co.
Sherwood Mfg. Co.
Walraven Co.
Exporters (Cotton).
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Extractors—Hydro.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Works.
Fans—Electric.
Allis-Chalmers Mfg. Co.
American Blower Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Elec. Co.
Westinghouse Elec. & Mfg. Co.
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Fasteners (Belt).
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Feed Water Purifiers.
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Felting Machinery.
Smith & Furbush Mch. Co
Fence—Steel and Iron.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Fibre Products.
Diamond State Fibre Co.
Keystone Fibre Co.
Rogers Fibre Co.
Standard Fibre Co.
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(See Water Softening.)
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Rothacker Film Co.
Finishing.
(See Dyers, Bleachers and Finishers.)

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Iron and Brass Castings Cast Every Day.
LOMBARD Foundry, Machine, Boiler Works, and Supply Store.
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BUYERS' INDEX—Continued.

Finishing and Sizing Materials.
Althouse Chemical Co.
Aniline Dyes & Chemical, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Schrymser Co.
Bosson & Lane.
Corn Products Refining Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Kilpatrick & Co., A.
Newport Chemical Works, Inc.
Metz & Co., H. A.
Moore Oil Refining Co.
National Aniline & Chemical Co.
Roessler & Hasslacher Co.
Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques

Fire Doors.
Richards-Wilcox Mfg. Co.

Fire Door Hardware (Automatic).
Richards-Wilcox Mfg. Co.

Fire Escapes (Spiral).
Collins, J. D.

Fire Hose.
(See Paint—Fireproof.)

Fire Protecting Paint.
(See Hose—Fire.)

First Aid Room Equipment.
(See Hospital Equipment.)

Flooring (Hardwood).
Nashville Hardwood Flooring Co.

Floor Scrubbing Machine.
American Scrubbing Machine Co.

Fluted Rolls.
Howard & Bullough.
Saco-Lowell Shops.
Schofield's Sons Co., J. S.
Smith & Furbush Machine Co.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Flyers.
Howard & Bullough.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Fountains (Drinking).
Central Brass Mfg. Co.
Crane Co.
Jewett Refrigerator Co.
Mfg. Equipment & Eng'g Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Southern States Supply Co.
Taylor Co., Halsey W.

Friction Clutches.
(See Clutches—Friction.)

Fuses.
(See Elec. Mchy. and Supplies.)

Garage Door Hardware.
Richards-Wilcox Mfg. Co.

Garnett Machines.
Roy Son Co., B. S.
Smith & Furbush Mach. Co.

Gas Engines.
(See Engines—Gas.)

Gasoline Tanks and Pumps.
Wayne Oil Tank & Pump Co.

Gaskets.
Diamond State Fibre Co.
Graton & Knight Mfg. Co.

Gauge Cocks.
Lunkenheimer Co.

Gauges—Draft.
Taylor Instrument Co.

Gauges—Mercury Column Vacuum.
Taylor Instrument Co.

Gauges—Oil.
Lunkenheimer Co.

Gauges—Water.
Lunkenheimer Co.

Gears—Silent.
Diamond State Fibre Co.
General Electric Co.
Link-Belt Company.
Morse Chain Co.

Gear Cutting and Cutters.
Cresson-Morris Co.
Southern Welding & Machine Co.
Reischmann Co.
Whitin Mch. Co., D. E.

Gear Pullers.
Greb Co., Inc.

Generators—Electric.
(See Motors and Generators.)

Graphite—Products.
Dixon Crucible Co., Jos.

Grates (Boiler).
International Eng. Works.
Lombard Fdy. & Mch. Co.
McNaughton Mfg. Co.

Grease.
(See Lubricants.)

Grease Cups.
(See Lubricators.)

Grindstones.
Richards-Wilcox Mfg. Co.

Grinders—Card, Cylinder Roll, Napper and Garnett.
(See Card Grinding Machinery.)

Guards (Elec. Lamp.)
Flexible Steel Lacing Co.

Guides (Thread).
Mitchell-Bissell Co.
Palmer Co., I. E.

Gums.
(See Finishing and Sizing Materials.)

Hangers.
(See Shafting and Hangers.)

Harness—Loom.
American Supply Co.
Crompton & Knowles Loom Wks.
Emmons Loom Harness Co.
Garland Mfg. Co.

Heads (Bobbin & Spool).
Diamond State Fibre Co.

Heating and Ventilating Apparatus.
(See Ventilating Apparatus.)

Heddles.
Crompton & Knowles Loom Wks.
Draper Corporation.
Steel Heddle Mfg. Co.

Heddle Frames.
Crompton & Knowles Loom Wks.
Steel Heddle Mfg. Co.

Hinges & Butts.
McKinney Mfg. Co.

Hoists.
Link-Belt Company.
Morse Chain Co.
Pasco Tool Co.
Seeger Machine Tool Co.
Walraven Co.

Hose—Fire.
Collins, J. D.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Hosiery Dyeing Machinery.
Cocker Mch. & Fdry. Co.
Rome Mach. & Fdry. Co.

Hosiery Finishing Boards.
(See Boards.)

Hosiery Forms.
(See Drying Forms.)

Hosiery Yarns.
(See Yarn Manufacturers.)

Hospital Equipment.
Thomas Co., F. H.
Wright Co.

Hotels.
Sinton.

Houses (Ready-Made).
(See Bungalows.)

Humidifying Apparatus.
American Blower Co.
Carrier Eng. Corp.
New York Blower Co.
Parks-Cramer Co.
Sturtevant Co., B. F.

Hydraulic Turbines.
(See Turbines—Steam.)

Hydro Extractors.
(See Extractors.)

Hydrometers.
Taylor Instrument Co.

Hygrometers.
Taylor Instrument Co.

Hygrodeiks.
Taylor Instrument Co.

Indicating and Recording Instruments.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Indigo.
(See Dyestuffs and Chemicals.)

Injectors.
Lunkenheimer Co.
Sherwood Mfg. Co.

Insulation (Vulcanized Fibre).
Diamond State Fibre Co. Sai

Insurance.
Miller Indemnity Underwriters.

Ink—Stencil and Marking.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Iron Work—Ornamental.
American Cast Iron Pipe Co.
Anchor Post Iron Works.
Cyclone Fence Co.
Dufur & Co.
Lombard Iron Works & Supply Co.

Jacks.
Paulus, Chas. B.

Jacquards.
Crompton & Knowles Loom Wks.

Jute Bagging Machines.
Smith & Furbush Mach. Co.

Kettles—Size.
(See Size Kettles.)

Kettles—Soda.
Lombard Iron Works & Sup. Co.

Kiers.
(See Bleaching Kiers.)

Knit Goods.
(See Cotton Cloth Commission Merchants and Dealers.)

Knit Goods Washers.
(See Washers—Cloth.)

Knitting Machinery and Supplies.
Adams Co., Geo. H.
Boss Knitting Mach. Works.
Brinton Co., H.
General Machine Works.
Hemphill Mfg. Co.
Nye & Tredick Co.
Scott & Williams.
Wildman Mfg. Co.

Lacing (Belt).
Crescent Belt Fastener Co.

Lamps—Incandescent and Arc.
Adams-Bagnall Eelectric Co.
Benjamin Electric Co.
Boston Economy Lamp Div.
Bryan Electric Co.
Carter Electric Co.
Jones Mchry. Corp.
General Electric Co.
Walraven Co.
Westinghouse Lamp Co.

Lamp Guards (Key Locking).
Flexible Steel Lacing Co.

Lamp Reflectors.
Adams-Bagnall Eelectric Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Elec. Co.
Ivanhoe-Regent Works.
Nela Specialties Division

Landscape Architects.
(See Village Architects.)

Lappers.
Saco-Lowell Shops.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Latch Needles.
Paulus, Chas. B.

Laundry Machinery.
American Laundry Mchry. Co.
Fletcher Works.
Schaum & Uhlinger.
Tolhurst Machine Wks.

Lavatories.
Crane Co.
Mfg. Equipment & Eng'g Co.
Mott Southern Co.
Taylor Co., Halsey W.
Jos. A. Vogel Co.

Leather Belting.
(See Belting.)

Leather Specialties.
American Supply Co.
Graton & Knight Mfg. Co.
Jewell Belting Co.
Ladew & Co., Inc Edw. R.
Williams & Sons, I. B.

Linen Yarns.
(See Yarns—Linen.)

Link Belting.
(See Belting—Linen.)

Linters.
(See Waste Dealers.)

Liquid Chlorine.
(See Chlorine.)

Loaders—Wagon and Trucks.
Link-Belt Company.
Portable Machinery Co.

Locks and Latches.
Richards-Wilcox Mfg. Co.

Lockers (Metal).
Collins, J. D.
Medart Mfg. Co., Fred.

Logwood Extract.
(See Dyestuffs and Chemicals.)

Looms.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Hopedale Mfg. Co.
Jones Mchry. Corp.
Mason Machine Works.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield, Wm. & Co.
Stafford Co., The

Loom Attachments (Auto).
Draper Corp.
Hopedale Mfg. Co.

Lumber (See Building Material).

Lubricants.
Dixon, Jos., Crucible Co.
N. Y. & N. J. Lubricant Co.
Swan & Finch Co.
Texas Co.

Lubricant, Tanks and Pump.
Wayne Oil Tank & Pump Co.

Lubricators.
Lunkenheimer Co.
N. Y. & N. J. Lubricant Co.
Sherwood Mfg. Co.

Lug Straps.
(See Straps—Lug.)

Lunch Room Equipment.
(See Restaurant.)

Machine Tools.
(See Tools.)

Marking (Dry Transfer).
Kaumagraph Co.

Marking Pots, Stencils, Inks, Etc.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Lovingood Co.
National Marking Machine Co.
Regnas & Co., J. R.

Marking Machines.
National Marking Machine Co.

Mercerized Yarns.
(See Yarns Mercerized.)

Mercerizing Machinery.
Butterworth, H. W. & Sons Co.
Textile Finishing Machinery Co.

Metal Ceilings, Etc.
Lupton's Sons Co., David

Metals (Perforated).
(See Screens and Sieves.)

Metal Workers—Sheet.
Lombard Iron Works & Supply Co.

Meters—Flow, Air, Gas, Electric, Steam, Etc.
Allis-Chalmers Mfg. Co.
Benjamin Electric Co.
Bryan Electric Co.
Carter Electric Co.
General Electric Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.
Westinghouse Elec. & Mfg. Co

Meters (Revolution)
Taylor Instrument Co.

Mill Baskets and Boxes.
(See Boxes—Mill.)

Mill Engineer.
(See Architects and Engineers.)

Mill Villages.
(See Villages.)

Mill Supplies (Misc.).
(See Supplies—Mill).

Mill White Paint.
(See Paint—Mill White.)

Monorail Conveying Systems.
Richards-Wilcox Mfg. Co.

Motors and Generators—Electric.
Adams-Bagnall Eelectric Co.
Allis-Chalmers Mfg. Co.
Bryan Electric Co.
Carter Electric Co.
Crymes Mchry. & Supply Co.
Dixie Electrical Equipment Co.
General Electric Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.

Moving Picture Mach. & Supplies.
Lucas Theatre Supply Co.
Rothacker Film Co.
Southern Theatre Equip. Co.

Mule Stands.
Transmission Ball Bearing Co.

Nails—Cement Coated.
Lovingood Co.
Regnas Co., J. R.

Nappers.
Roy & Son Co., B. S.

Needles—Latch.
Paulus, Chas. B.

Oils.
Hampden Paint & Chem. Co.
Wadsworth, Howland & Co., Inc.

Oils—Finishing
(See Finishing and Sizing Materials.)

Oils—Lubricating.
(See Lubricants.)

Oil Cups.
(See Lubricators.)

Oil Paper.
Bradley Mfg. Co., A. J.

Oil Tanks & Pumps.
Wayne Oil Tank & Pump Co.

Oiling Devices.
(See Lubricators.)
Inc.

Openers for Cotton, Wool, Waste Etc.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Oxidizing Machinery.
Phila. Drying Machinery Co.

Oxygen.
Commercial Acetylene Supply Co.
Linde Air Products Co.
Oxweld Acetylene Co.
Prest-O-Lite Co.
Standard Gas Products Co.

Packings.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Jenkins Bros.
Walraven Co.
U. S. Rubber Co.

Paint.
Atlanta Gas Light Co.
Barrett Co., The
Du Pont de Nemours & Co., E. I.
Excello Mfg. Co.
Gulf States Creosoting Co.
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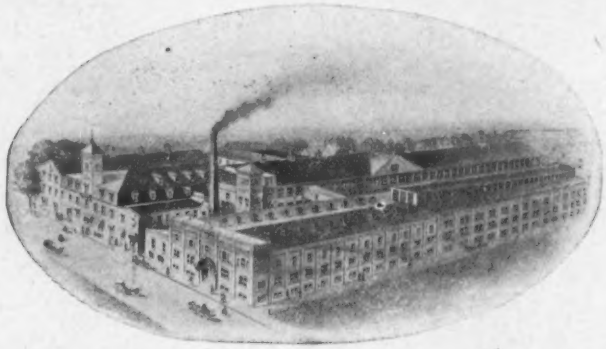

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BUYERS' INDEX—Continued.

Johnson Paint Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.
Ware-Smith Paint Co.

Paint—Preservative and Fireproof.
Atlanta Gas Light Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Excello Mfg. Co.
Hampden Paint & Chem. Co.
Gulf States Creosoting Co.
Hurst Co.
Johnson Paint Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co.
Walraven Co.
Ware-Smith Paint Co.

Paint—Mill White.
Du Pont de Nemours & Co., E. I.
Excello Mf · Co.
Hurst Co.
Hampden Paint & Chem. Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co., Inc.
Ware-Smith Paint Co.

Paper.
Bradley Mfg. Co., A. J.
Diamond State Fibre Co.

Perforated Metal.
(See Screens and Sieves.)

Peroxides.
Roessler & Hasslacher Chemical Co.

Pickers—Curled Hair.
Schofield, Wm. Co.
Smith & Furbush Mach. Co.

Pickers—Leather.
Garland Mfg. Co.

Picker Sticks.
Garland Mfg. Co

Picking Machinery.
Howard & Bullough, Am. Machine Co.
Saco-Lowell Shops.
Schofield Co., Wm.
Smith & Furbush Mach. Co.
Whitin Machine Works.

Pinions.
Diamond State Fibre Co.

Pipe Fittings.
Crane Co.
Lunkenheimer Co.
Walraven Co.

Pipe Threading & Cutting Machines.
Seeger Machine Tool Co.
Walraven Co., The

Playground Equipment.
Hill-Standard Co.
Medart Mfg Co., Fred.

Pool Tables, Etc.
Brunswick-Balke-Collender Co.

Power Transmission.
Aldrich Mch. Wks.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Mch. Co.
Cresson-Morris Co.
Crymes Mchry. & Supply Co.
Dodge Sales & Eng. Co.
General Electric Co.
Goodyear Tire & Rubber Co.
Graton & Knight Mfg. Co.
Hyatt Roller Bearing Co.
Jewell Belting Co.
Jones Mchry. Corp.
Ladew & Co., Inc., Edw. R.
Link-Belt Company.
Morse Chain Co.
New Departure Mfg. Co.
S K F Industries.
Seeger Machine Tool Co.
Standard Pressed Steel Co.
Stanley Belting Corp.
U. S. Ball Bearing Co.
U. S. Rubber Co.
Valley Iron Works.
Walraven Co., The
Westinghouse Elec. & Mfg. Co.
Williams & Sons, I. B.

Presses.
American Laundry Machnry. Co.
Bridge & Co., Ltd., David
Butterworth & Sons Co., H. W.
Economy Baler Co.
Gallard-Henning Mfg. Co.
Lovingood Co.
Phila. Drying Mch. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Seeger Machine Tool Co.
Smith & Furbush Mch. Co.
Textile Finishing Machinery Co., The

Pulleys.
Cresson-Morris Co.
Diamond State Fibre Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Seeger Machine Tool Co.
Valley Iron Works.
Walraven Co., The

Pulley Covering.
Goodyear Tire & Rubber Co.
Stanley Belting Corp.
Williams & Sons, I. B.

Pumps.
Allis-Chalmers Mfg. Co.
Jones Mchry. Corp.
Seeger Machine Tool Co.
Textile Finishing Machinery Co.
Toomey, Frank
Walraven Co.
Walsh & Weidner Boiler Co., The
Westinghouse Elec. & Mfg. Co.

Pump Oil).
Mayne Oil Tank &Pump Co.

Pump Valves.
(See Valve Discs.)

Psychrometers (Sling).
Taylor Instrument Co.

Pyrometers.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Quill Cleaning Machines.
Terrell Mch. Co.
Dufur & Co

Receptacles (Fibre).
(See Fibre Products.)

Recording Instruments.
Powers Regulator Co.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Reeds.
American Supply Co.
Emmons Loom Harness Co.

Reed Polishing Machines.
Shawmut Eng'g Co.

Reels.
Cocker Mch. & Fdry. Co.
Crompton & Kowles Loom Wks.
Draper Corporation.
Saco-Lowell Shops.
Schofield, Wm. Co.
Whitin Machine Works.

Reflectors (Lamp).
Adams-Bagnall Eelectric Co.
Benjamin Electric Co.
Carter Elec. Co.
Ivanhoe-Regent Works.
Nela Specialties Division.

Refrigerating Machines.
Jewett Refrigerator Co.
Southern States Supply Co.

Regulators—Pressure.
Tagliabue Mfg. Co., C. J.
Taylor Instrument Co.

Regulators—Temperature.
(See Temperature Controllers.)

Reinforcement Bars for Concrete.
Corrugated Bar Co.

Repairing (Electrical).
Jones Mchry. Corp.

Repairing (Textile Mchry, etc).
Atlanta Welding Co.
Chattanooga Brazing & Welding Co.
General Machine Works.
Southern Spindle & Flyer Co.
Standard Gas Products Co.

Restaurant Equipment.
Jewett Refrigerator Co.
Reischmann Co.
Wright Co.

Rib Top Cutters.
General Machine Works.
Wildman Mfg. Co.

Ring Travelers—Steel and Bronze.
Whitinsville Spining Ring Co.
Whitin Machine Works.

Rings—Spinning.
(See Spinning Rings.)

Rivets (Belt).
Crescent Belt Fastener Co.

Rocker Shaft Bearings.
(See Bearings.)

Rolls (Calender.)
Roy & Son Co., B. S.

Rolls—Steel.
Southern Spindle & Flyer Co.

Roofing.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co., The
High-Grade Mfg. Co.
Cortright Metal Roofing Co.
Johnson Paint Co.
Peaslee-Gaulbert Co., Inc.
Wadsworth, Howland & Co.
Walraven Co.
Ware-Smith Paint Co.

Roofing Felt and Pitch.
Atlanta Gas Light Co.

Roof and Cement Coating.
Asphalt Roofing Co.
Atlanta Gas Light Co.
Barrett Co.
Du Pont de Nemours & Co., E. I.
Excello Mfg. Co.
Hampden Paint & Chemical Co.
High-Grade Mfg. Co.
Hurst Co.
Johnson Paint Co.
Peaslee-Gaulbert Co., Inc.
Tropical Paint Co.
Wadsworth, Howland & Co.
Ware-Smith Paint Co.

Rope—Transmission.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Company.
Walraven Co.

Roving Cans and Trucks.
(See Cans—Roving.)

Roving Machinery.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

Rubber Stamps.
(See Stamps, Stencils, Etc.)

Rubber Goods.
Goodyear Tire & Rubber Co.
U. S. Rubber Co.

Sanitary Products.
Crane Co.
Dail Steel Products Co.
Hackney Bros. Co.
Kaustine Co.
Mott-Southern Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

Sash-Window—Steel.
Detroit Steel Products Co.
Lupton's Sons Co., David

Scales.
American Kron Scale Co.
Lovingood Co.
Standard Scale & Supply Co.
Torsion Balance Co.

Scale Preventer (Boiler).
(See Boiler Feed Water Purification.)

Screens & Sieves—Perforated.
Beckley Perforating Co.
Erdle Perforating Co.
Link-Belt Company.

Scrubbing Machine—Floor.
American Scrubbing Mch. Co.

Second Hand Machinery & Supplies.
Atlanta Textile Mchry. Co.
Crymes Mchry. & Supply Co.
Jones Mchry. Corp.
Toomey, Frank, Inc.
Walraven Co.

Sewing Machines.
Merrow Machine Co., The
Textile Finishing Mchy. Co.
Wilcox & Gibbs Sewing Mach. Co.

Shades (Electric Lamp).
(See Reflectors).

Shafting & Hangers.
Cresson-Morris Co.
Dodge Sales & Eng. Co.
Link-Belt Co.
Seeger Machine Tool Co.
S K F Industries.
Standard Pressed Steel Co.
Valley Iron Works.
Walraven Co., The

Shears.
Roy & Son Co., B. S.

Shelving—Sectional Steel.
Collins, J. D.
Lupton's Sons Co., David
Medart Mfg. Co., Fred.

Shingles—Asphalt.
Barrett Co.

Shingles—Metal.
Cortright Metal Roofing Co.

Shipping Room Machinery and Supplies.
Acme Steel Goods Co.
American Kron Scale Co.
Atlanta Stamp & Stencil Works.
Baker, R. & L. Co.
Bradley Mfg. Co., A. J.
Collins, J. D.
Diamond State Fibre Co.
Elwell-Parker Elec. Co.
Holyoke Truck Co.
Hulme, J. S.
Keystone Fibre Co.
Lane & Bro., W. T.
Lovingood Co.
McKinney Mfg. Co.
Regnas & Co., J. R.
Rogers Fibre Co.
Standard Scale & Supply Co.
Standard Fibre Co.
Seeger Machine Tool Co.
Signode System, Inc.
Torsion Balance Co.
Walraven Co., The

Shower Baths.
Crane Co
Mott-Southern Co.

Shuttles.
Brown Co., David
Crompton & Knowles Loom Wks.
Draper Corporation.
Shambow Shuttle Co.

Sinkers.
Paulus, Chas. R.

Singeing Machinery.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The

Size Box Temperature Controller.
Powers Regulator Co.
Taylor Instrument Co.
Tagliabue Mfg. Co., C. J.

Size Kettles.
Butterworth, H. W. & Sons Co.
Howard & Bullough, American Machine Co.
Lombard Iron Works & Sup. Co.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Sizing and Finishing Compounds.
(See Finishing & Sizing Materials.)

Skewers.
Brown Co., David
Greenville Spool & Mfg. Co.
Jordan Mfg. Co.

Skylights—Steel.
Detroit Steel Products Co.
Lupton's Sons, Co., David

Slag.
Birmingham Slag Co.

Slashers and Slasher Room Supplies.
Butterworth & Sons Co., H. W.
Cocker Mch. & Foundry Co.
Howard & Bullough.
Lovingood Co.
Mossberg Co., Frank
Regnas & Co., J. R.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The

Slasher Tape.
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Slate Asphalt Roofing.
Barrett Co.

Sliding Partition Hardware.
Richards-Wilcox Mfg. Co.

Slubbers.
Howard & Bullough.
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Whitin Machine Works.

Soap—Textile.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Dow Chemical Co.
Du Pont de Nemours & Co., E. I.
Electric Smelting & Alum. Co.
Grasselli Chemical Co.
Kali Mfg. Co.
Hemingway & Co., Frank
Kilpstein & Co., A.
Newport Chemical Works.
United Chemical Products Corp.
Warren Soap & Mfg. Co.
Wolf & Co., Jacques

Softeners—Cotton.
Althouse Chemical Co.
Aniline Dyes & Chemicals, Inc.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Atlantic Dyestuff Co.
Borne, Schrymser Co.
Bosson & Lane.
Dow Chemical Co.
Durex Chemical Co.
Du Pont de Nemours & Co., E. I.
Grasselli Chemical Co.
Hemingway & Co., Frank
Kali Mfg. Co.
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Newport Chemical Works.
Roessler & Hasslacher Chemical Co.
United Chemical Products Corp.
Wolf & Co., Jacques

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Westinghouse Elec. & Mfg. Co.

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Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

Spindles—Ball Bearing.
Allen Spindle Corp.

Spinners.
Arlington Cotton Mills.
Arrow Mills, Inc.
Flint Mfg. Co.
Gray Mfg. Co.
Hunter Mfg. & Comm. Co.
Myrtle Mills, Inc.
Parkdale Mills, Inc.

Spinning Frames.
American Machine Co., H. & B.
Crompton & Knowles Loom Wks.
Draper Corporation.
Fletcher Works.
Flonsheim, H. A.
Howard & Bullough.
Saco-Lowell Shops.
Schaum & Uhlinger.
Whitin Machine Works.

Spinning Rings.
Draper Corporation.
Howard & Bullough.
Greenville Spool & Mfg. Co.
Southern Novelty Co.

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Whitinsville Spinning Ring Co
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Rogers Fibre Co.
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Scott & Henry Co., L.

GEORGIA RAILROAD

Passenger Department

SCHEDULE CHANGES

ALL AGENTS AND CONNECTIONS:

Effective April 25, 1920, there will be important changes in schedule on the Georgia Railroad. New time at terminals and junction points shown below:

MAIN LINE—Eastbound.

No. 2—Daily—Leave Atlanta 5:55 A. M. (Central Time), Covington 8:24 A. M. (Eastern Time), Social Circle 9:00 A. M., Madison 9:35 A. M., Union Point 10:35 A. M., Barnett 11:15 P. M., Camak 10:40 A. M., arrive Augusta 1:35 P. M.

No. 6—Daily—Leave Atlanta 12:15 P. M. (Central Time), Covington 2:30 P. M. (Eastern Time), Social Circle 2:50 P. M., Madison 3:20 P. M., Union Point 4:10 P. M., Barnett 4:50 P. M., Camak 5:12 P. M., Thomson 5:30 P. M., arrive Augusta 6:40 P. M.

No. 8—Daily—Leave Atlanta 3:25 P. M. (Central Time), Covington 5:57 P. M., (Eastern Time), Social Circle 6:19 P. M., Madison 6:50 P. M., Union Point 7:40 P. M., Barnett 8:32 P. M., arrive Camak 8:55 P. M., leave 9:10 P. M., arrive Augusta 10:45 P. M.

No. 4—Daily—Leave Atlanta 7:40 P. M. (Central Time), as at present, flag at Decatur 9:00 P. M. (Eastern Time), Covington 10:01 P. M., Social Circle 10:25 P. M., Madison 10:55 P. M., arrive Augusta 2:25 A. M. as at present.

No. 14—Daily—Leave Atlanta 6:10 P. M. (Central Time) as at present, arrive Social Circle 9:25 P. M. (Eastern Time). (This train was formerly operated daily except Sunday).

No. 10—Daily—Washington to Augusta—No Change.

MAIN LINE—Westbound.

No. 3—Daily—Leave Augusta 2:15 A. M. (Eastern Time) as at present, Madison 5:45 A. M., Social Circle 6:20 A. M., Covington 6:45 A. M., arrive Atlanta 7:25 A. M. (Central Time). Flag at Conyers, Lithonia, and Decatur to discharge passengers from points beyond Social Circle.

No. 1—Daily—Leave Augusta 7:00 A. M. (Eastern Time), Camak 8:55 A. M., Barnett 9:22 A. M., Union Point 10:00 A. M., Madison 11:05 A. M., Social Circle 11:45 A. M., Covington 12:10 P. M., arrive Atlanta 12:50 P. M. (Central Time).

No. 5—Daily—Leave Augusta 11:00 A. M. (Eastern Time), Thomson 12:10 P. M., Camak 12:30 P. M., Barnett 12:50 P. M., Union Point 1:25 P. M., Greensboro, 1:40 P. M., Madison 2:20 P. M., Social Circle 2:50 P. M., Covington 3:11 P. M., arrive Atlanta 3:35 P. M. (Central Time).

No. 7—Daily—Leave Augusta 3:00 P. M. (Eastern Time) as at present. No change up to Union Point, Greensboro 6:00 P. M., Madison 6:50 P. M., Social Circle 7:26 P. M., Covington 7:48 P. M., arrive Atlanta 8:20 P. M. (Central Time).

No. 9—Daily—Leave Augusta 6:15 P. M. (Eastern Time), Camak 8:27 P. M., Barnett 8:55 P. M.

No. 13—Daily, except Sunday—Leave Social Circle 6:30 A. M. (Eastern Time), Covington 6:55 A. M., Conyers 7:17 A. M., Lithonia 7:30 A. M., Stone Mountain 7:58 A. M., arrive Atlanta 7:40 A. M. (Central Time).

No. 15—Sunday only—Leave Social Circle 7:45 A. M. (Eastern Time), Covington 8:10 A. M., Conyers 8:37 A. M., Lithonia 8:50 A. M., Stone Mountain 9:10 A. M., arrive Atlanta 8:50 A. M. (Central Time).

MACON DIVISION (Eastern Time).

No. 31—Daily—Leave Camak 9:05 A. M., Sparta 10:00 A. M., Milledgeville 10:58 A. M., arrive Macon 12:20 P. M.

No. 33—Daily—New Train. Leave Camak 5:20 P. M., Sparta 6:16 P. M., Milledgeville 7:08 P. M., arrive Macon 8:30 P. M.

No. 35—Daily—Leave Camak 9:25 P. M., Sparta 10:26 P. M., Milledgeville 11:21 P. M., arrive Macon 12:40 A. M.

No. 30—Daily—Leave Macon 5:20 A. M., Milledgeville 6:40 A. M., Sparta 7:36 A. M., arrive Camak 8:45 A. M.

No. 32—Daily—New Train. Leave Macon 1:35 P. M., Milledgeville 2:45 P. M., Sparta 3:30 P. M., arrive Camak 4:40 P. M.

No. 34—Daily—Leave Macon 5:50 P. M., Milledgeville 7:08 P. M., Sparta 8:08 P. M., arrive Camak 9:05 P. M.

ATHENS DIVISION (Eastern Time).

No. 51—Daily—Leave Union Point 10:50 A. M., Crawford 11:47 A. M., arrive Athens 12:40 P. M.

No. 53—Daily—Leave Union Point 8:00 P. M., Crawford 8:54 P. M., arrive Athens 9:45 P. M.

No. 50—Daily—Leave Athens 8:00 A. M., Crawford 8:41 A. M., arrive Union Point 9:45 A. M.

No. 52—Daily—No change.

WASHINGTON BRANCH (Eastern Time).

No. 41—Daily—No change.

No. 43—Daily—No change.

No. 9—Daily—Leave Barnett 9:00 P. M., arrive Washington 9:50 P. M.

No. 40—Daily—Leave Washington 8:15 A. M., arrive Barnett 9:05 A. M.

No. 42—Daily—No change.

No. 44—Daily except Sunday—No change.

No. 10—Daily—No change.

MONROE BRANCH (Eastern Time).

No. 83—Daily—Leave Social Circle 9:05 A. M., arrive Monroe 9:40 A. M.

No. 85—Daily—Leave Social Circle 12:05 P. M., arrive Monroe 12:40 P. M.

No. 87—Daily—Leave Social Circle 6:20 P. M., arrive Monroe 6:50 P. M.

No. 91—Daily—Leave Social Circle 9:30 P. M., arrive Monroe 10:00 P. M.

No. 82—Daily—Leave Monroe 11:05 A. M., arrive Social Circle 11:35 A. M.

No. 84—Daily—Leave Monroe 5:35 P. M., arrive Social Circle 6:05 P. M.

No. 86—Daily—Leave Monroe 6:50 P. M., arrive Social Circle 7:20 P. M.

No. 90—Daily except Sunday—Leave Monroe 6:00 A. M., arrive Social Circle 6:30 A. M.

No. 92—Sunday only—Leave Monroe 7:10 A. M., arrive Social Circle 7:40 A. M.

LEXINGTON BRANCH (Eastern Time).

No. 71—Daily except Sunday—Leave Crawford 9:00 A. M., arrive Lexington 9:25 A. M.

No. 73—Daily except Sunday—Leave Crawford 11:55 A. M., arrive Lexington 12:20 P. M.

No. 75—Daily except Sunday—Leave Crawford 4:40 P. M., arrive Lexington 5:05 P. M.

No. 70—Daily except Sunday—Leave Lexington 8:00 A. M., arrive Crawford 8:25 A. M.

No. 72—Daily except Sunday—Leave Lexington 11:00 A. M., arrive Crawford 11:25 A. M.

No. 74—Daily except Sunday—Leave Lexington 3:45 P. M., arrive Crawford 4:10 P. M.

UNION POINT & WHITE PLAINS RAILROAD.

Daily Except Sunday. Eastern Time.

No. 61—Leave Union Point 10:55 A. M., arrive White Plains 11:55 A. M.
No. 63—Leave Union Point 8:00 P. M., arrive White Plains 8:50 P. M.
No. 60—Leave White Plains 8:35 A. M., arrive Union Point 9:35 A. M.
No. 62—Leave White Plains 4:25 P. M., arrive Union Point 5:25 P. M.

Please give the above schedule figures all publicity possible.

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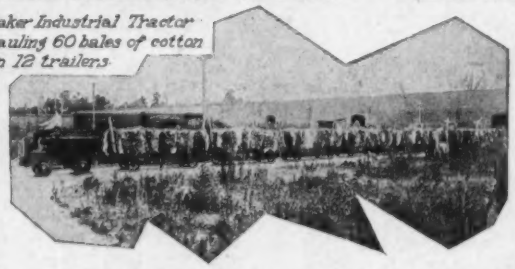

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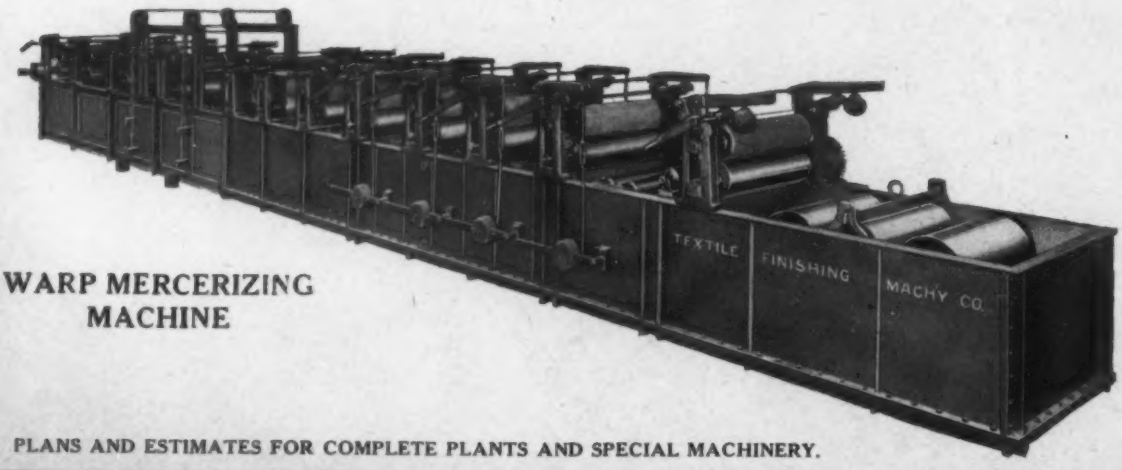

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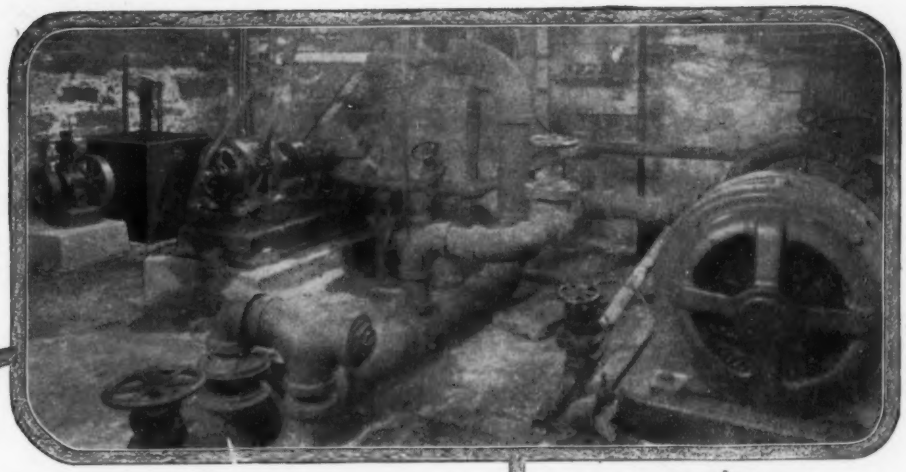

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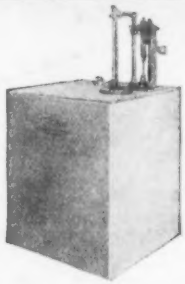

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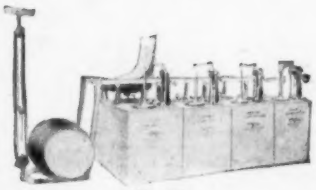

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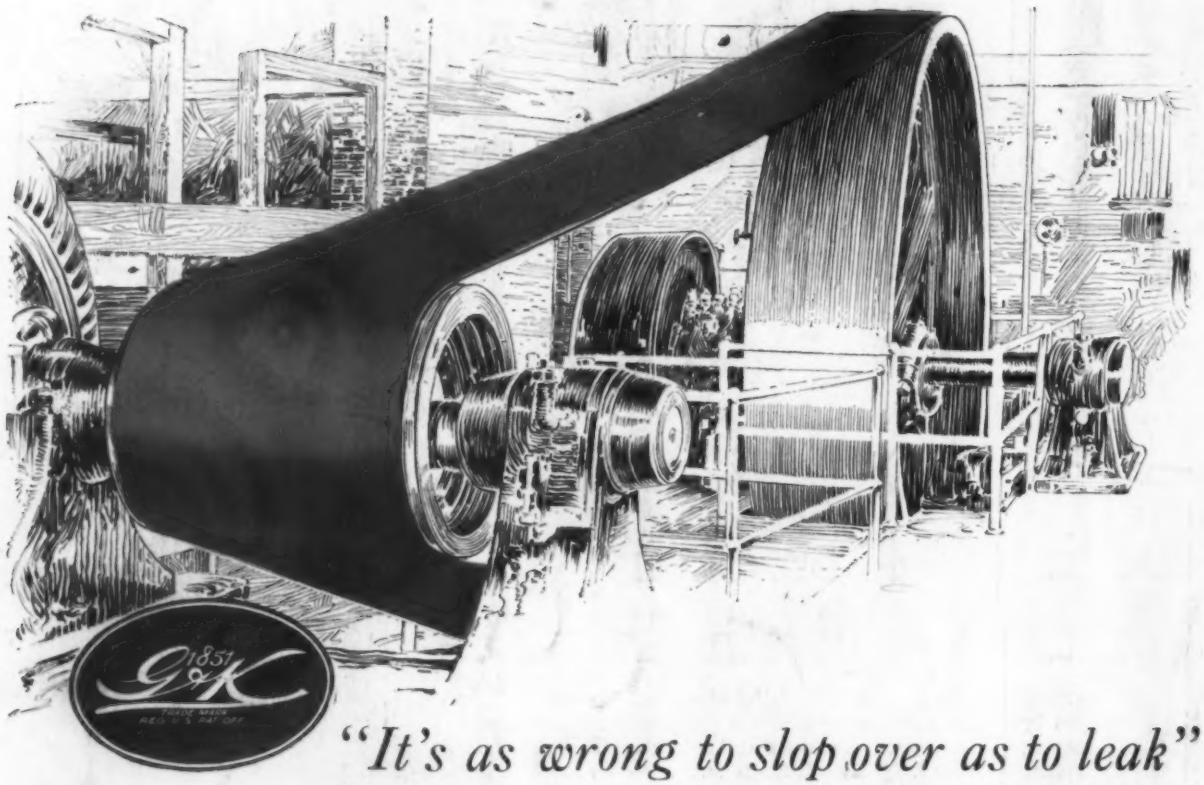

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